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ABSTRACT

The purpose of this annual report is to provide the managers of scientific and technical information programs with an overview of information related developments in the federal government. Other individuals concerned with information needs of their organizations may also find this publication useful. Descriptions of over 60 programs engaged in various information handling activities are provided. Federal agency scientific and technical information activities listed include those from the Departments of Agriculture, Commerce, Defense, Health, Education and Welfare (HEW), Housing and Urban Development (HUD), Justice, State, Transportation, the Environmental Protection Agency, Government Printing Office, and the Library of Congress. Under each agency, the information processing and dissemination programs of the various bureaus, offices, and administrations are described. A glossary of acronyms, a list of persons associated with the program described, and a general index are appended. (MR)

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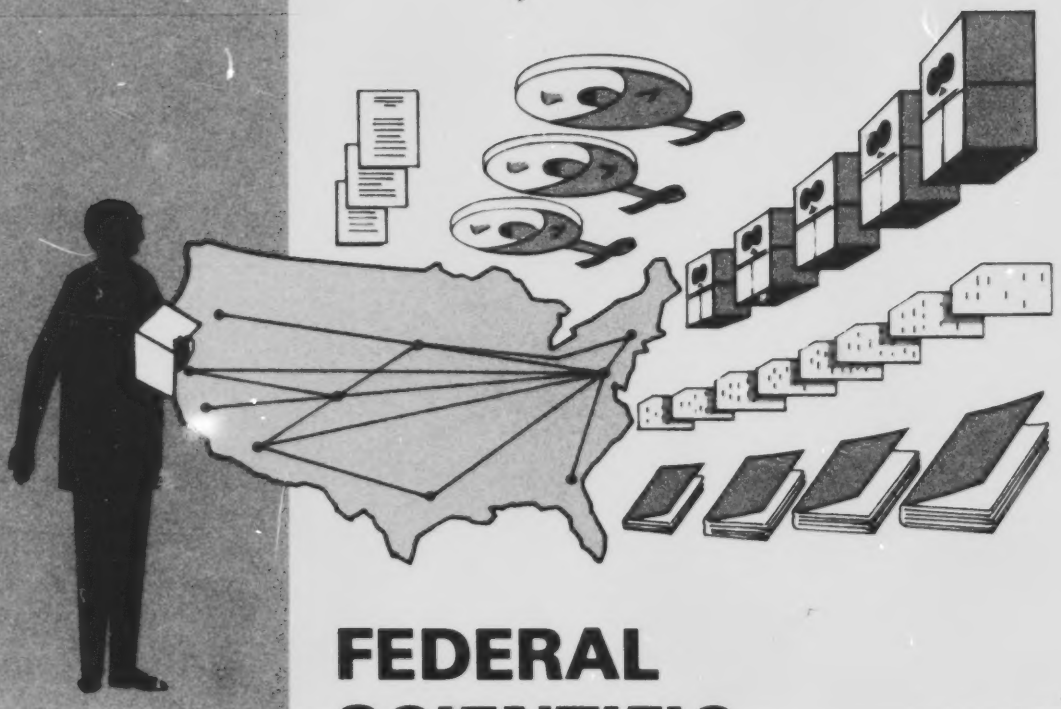

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FEDERAL SCIENTIFIC AND TECHNICAL COMMUNICATION ACTIVITIES

—1976—

October 1977

NATIONAL SCIENCE FOUNDATION
Directorate for Scientific, Technological and International Affairs
Division of Science Information
Washington, D. C. 20550

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NATIONAL SCIENCE FOUNDATION

WASHINGTON, D.C. 20550

Division of Science Information

TO RECIPIENTS OF 1976 ANNUAL REPORT

The purpose of this report is to provide the managers of scientific and technical information programs with an overview of information-related developments in the Federal Government. Other individuals concerned with information needs of their organizations may also find this report useful.

The report begins with a chapter which analyzes the data submitted by the agencies and continues with the descriptions of over sixty programs engaged in various information handling activities. A glossary of acronyms, a list of persons associated with the programs described, and a general index are appended.

Additional copies of the report may be obtained from:

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Comments concerning the report's contents and suggestions for its future editions are welcome.

Sincerely,

Lee G. Burchinal
Director

Enclosure

FOREWORD

The foregoing publication is a continuation of annual reports begun in 1963 by the Committee on Scientific and Technical Information (COSATI) on the activities of Federal scientific and technical information programs. Discontinued in 1972, reports began again in 1974, this time under the aegis of the Office of Science Information Service, now the Division of Science Information (DSI), National Science Foundation (NSF). The 1974 report is available from the National Technical Information Service as the "Federal Scientific and Communication Activities: 1974 Progress Report," PB 242 318, June 1975; the 1975 report carries a similar title and its NTIS accession number is PB 253 975.

The 1976 report represents the third in the renewed series. Descriptions of scientific and technical information activities of the Federal agencies were provided voluntarily at the request of the Division of Science Information. This partially explains some unevenness in the descriptions and the absence of others. Several new features have been added to the report this year. The introductory chapter, on "Developments in Federal Scientific and Technical Communication Activities — 1976", is now augmented by a matrix which summarizes the basic features of selected Federal programs. The appendixes at the end of the report include the names and addresses of key personnel associated with individual programs; an index to publication titles listed in the text; and an expanded General Index of subject terms, program names and organizations. The main part of the report contains descriptions of 64 Federal programs in 16 executive departments and independent agencies as well as the Government Printing Office, the Library of Congress and the Smithsonian Institution.

Appreciation is extended to the many organizations and persons who contributed to the preparation of this report. Special recognition must be given to Professor Scott Adams of the University of Louisville for the preparation of the analytical chapter. Other persons connected directly with the report include those on the staff of the Franklin Institute Research Laboratories which compiled this report under Contract DSI 77-14814; Mr. Eugene Pronko, Program Director, National and International Coordination Program; and Mr. Andrew A. Aines, Senior Staff Associate, both of DSI.

The Division of Science Information is pleased to make this report available and invites comments for use in preparing subsequent reports.

Lee G. Burchinal, Director
Division of Science Information
National Science Foundation

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DEVELOPMENTS IN FEDERAL SCIENTIFIC AND TECHNICAL COMMUNICATION ACTIVITIES 1976 *

Two main developments in 1976 related to scientific and technical information (STI) services provided by Federal Government agencies were: (a) resurgence of interest at high policy levels in the roles played by information systems in both national and international affairs, and (b) a steady growth of the information services provided by Federal agencies to other constituencies. This introduction to the 1976 Federal agencies activities report, a continuation of a series initiated in 1963 by the Committee on Scientific and Technical Information (COSATI) and continued since 1974 by the National Science Foundation, discusses the year's developments under these two headings.

TOWARD A NATIONAL SCIENTIFIC AND TECHNICAL INFORMATION POLICY

Public Law 94-282, the National Science and Technology Policy, Organization and Priorities Act of 1976, provided a statutory basis for the development of national STI policy. Specifically, the Act, which established the Office of Science and Technology Policy (OSTP), declared it to be the responsibility of the Federal Government "to promote prompt, effective, reliable and systematic transfer of science and technology information by such appropriate methods as programs conducted by non-governmental organizations, including industrial groups and technical societies." The Federal Government was also enjoined "not only to coordinate and unify its own science and technology information systems, but to facilitate the close coupling of institutional scientific research with the commercial application of the useful findings of science."

These statutory provisions have yet to be implemented by Executive action. However, Public Law 94-282 focuses attention on the need to create a top-level mechanism addressing the development of a coherent national information policy.

Prior to the passage of PL 94-282, the Special Subcommittee on the National Science Foundation of the Senate Committee on Labor and Public Welfare had commissioned a study of the role of the Federal Government, and in particular the National Science Foundation, in managing and monitoring scientific and technical information activities in both the public and private sectors.[1] The resulting report, prepared by Robert L. Chartrand of the Legislative Research Service, Library of Congress, reviewed the legislative and executive histories of Federal responsibility for the coordination of national scientific and technical information activities in the light of allegations that there was an information policy vacuum within the Federal Government, that the top-level interest of agency administrators was lacking and that the increasing importance of specialized information was being ignored. In receiving the report, the Chairman of the Subcommittee noted the possibility of future legislative action.

Under President Ford, the Domestic Council established a Committee on the Right of Privacy, which identified a series of problems arising from the impact of communications technology on society. Under the title, *National Information Policy*, the report, published by the National Commission on Libraries and Information Science[2], discussed a number of information policy issues, including some of special interest to the scientific and technical information community.

The issues commented upon include the relationship between the Government and the private sector in the production, publicaion and dissemination of information; the need to establish a national policy framework for balancing issues of competition and monopoly in shaping the national information infrastructure; the political, social and economic implications of information networks and information utilities; and the response to the recognition by less developed countries of the importance of the information sector to their economic and social development.

Included in the report of the Domestic Council were four major recommendations:

- that the United States set as a goal the development of a coordinated National Information Policy
- that an Office of Information Policy be established in the Executive Office of the President
- that an inter-agency Council on Information Policy be created to assist the Office
- that an Advisory Committee representative of the private sector, local government and academic disciplines be established to assist the Office.

Pressed by the growing demands of developing countries for access to U.S.-generated technological information,

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*"Any opinions, findings, conclusions, or recommendations expressed in this chapter are those of its author, Professor Scott Adams, and do not necessarily reflect the views of the National Science Foundation."

[1] U.S. Senate Committee on Labor and Public Welfare, Special Subcommittee on the National Science Foundation, Federal Management of Scientific and Technical Information (STINFO): The Role of the National Science Foundation, Washington, Government Printing Office, 1975. (Committee Print)

[2] U.S. Executive Office of the President, Domestic Council, Committee on the Right of Privacy, National Information Policy, Washington, National Commission on Libraries and Information Science, 1976. (For sale by the Superintendent of Documents)

the domain of U.S. foreign policy expanded to encompass this information. The bloc of developing countries known as "The Group of 77", in securing United Nations endorsement of a "New International Economic Order", had insisted that the developed nations accord them priority in the transfer of modernizing technologies. Secretary of State Kissinger, in a 1975 address to a U.N. Special Session, committed the United States to support the "creation of an International Center for the Exchange of Technological Information, as a clearinghouse for the sharing of ongoing research and new findings relevant to development".

A conflict arose when the United Nations Industrial Development Organization (UNIDO) responded to a proposal of the Group of 77 for an industrial technology information bank with its own planned center. A U.N. Inter-Agency Task Force was given the responsibility of coordinating U.N. program proposals for the transfer of technological information. The efforts of the Task Group during 1976 to convert these conflicting proposals into a global network for the exchange of technological information, of which the UNIDO data bank might be a component, were matched by a continuing restudy within the Department of State of the U.S. role in providing technological information to developing countries.

Planning for the proposed 1979 U.N. Conference on Science and Technology for Development will continue these developments. Since technological information exchange is such a highly visible aspect of the important issue of international technology transfer, it seems certain to be a recurring theme of the Conference.

The focus maintained by the Department of State in its role of facilitating communication in science and technology appears to be shifting from basic to applied sciences. The "Berkner Report", *Science and Foreign Relations* (1950)[3], which triggered the State Department's science attache system, accented the attache's usefulness in promoting the international exchange of scientific information. In contrast, the "Glennan Report"[4], *Technology and Foreign Affairs*, equally concerned with strengthening the role of applied science and technology in the Department of State, concerns itself with technological information only by implication. However, a thoughtful appendix by Dr. Herbert I. Fusfield delineates the roles played by information in the international transfer of technology.

Two other activities contributed further to the quest for policy-level recognition of the need to establish national science information policy. At the request of the National Science Foundation, the Mitre Corporation analyzed some dozen previous studies and recommendations and compared their results in four tables.[5] Mitre's report concludes with three recommendations: (1) that each Federal agency establish a single focus of responsibility and authority for scientific and technical information activities; (2) that a Federal Agency Coordinating Group be established; and (3) that an Information Policy Board, with representation from the private sector, State and local governments, professional groups and Federal agencies be established to help formulate national policy in this area.

Finally, the George Washington University conducted a three-part National Forum on Scientific and Technical Communication during 1976. The Forum's three sessions considered respectively new and unmet requirements for scientific and technical information from the point of view respectively of users, producers and policymakers. Of particular interest was the Forum's focus on the need for comprehensible and reliable scientific information in the political decisionmaking process.

In summary, there appears to be a reawakening of policy-level concern for the Federal Government's responsibility to provide responsive and responsible information services to the country. This is not, as in the post-Sputnik era, a frenetic insistence on immediate solutions and hyperactivity, but an evolving view that the Federal Government has major responsibilities for information in a post-industrial age, requiring both policy and program coordination.

FEDERAL AGENCY INFORMATION SERVICES

In 1976, there was a further increase in the volume and the quality of the information services provided by the Federal agencies to their constituencies. These trends can be illustrated by development in three areas:*

- expansion of bibliographic data bases, abstracting and indexing publications and mechanized search services
- further development of numeric data bases and services to non-governmental personnel
- strengthening of programs for the transfer of Government-funded technology to industry.

Bibliographic Data Bases

Several of the large bibliographic retrieval systems have now been operational for a dozen years or more and have accumulated large files of machine-readable bibliographic information. Four systems had more than a million entries by the close of the year.

MEDLINE, National Library of Medicine	2,787,000
NASA/RECON, National Aeronautics and Space Administration	1,881,185
DROLS, Defense Documentation Center	1,186,280
ERDA, Energy Research and Development Administration	1,009,546

The National Technical Information Service (NTIS) Data Base, with its end-of-year total of 998,000, will increase this group to five in 1977, and the AGRICOLA system of the National Agricultural Library with 864,400 is not far behind.

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[3] Berkner, Lloyd V. Science and Foreign Relations: International Flow of Scientific and Technological Information. Washington, U.S. Department of State, 1950. (Publication 3860)

[4] Glennan, T. Keith. Technology and Foreign Affairs: A Report. . .to Deputy Secretary of State, Charles W. Robinson. Washington, Department of State, 1976.

[5] Whalen, Bruce G., and Charles C. Joyce, Jr. Scientific and Technical Information: Options for National Action. The Mitre Corporation, McLean, Virginia 1976.

*The agencies provided supporting data for this section on information services as part of a survey conducted by the National Science Foundation.

The Division of Science Information collected data from 22 Federal abstracting and indexing programs. For these services, the cumulated total of citations was 11.3 million; the 1976 increment was 1.5 million; and the annual growth rate was 15 percent.

Other significant bibliographic data bases include ERIC/CIJE of the National Institute of Education (269,235), the Department of the Interior's Water Resources Scientific Information Center (102,803), Air Pollution Technical Information Coordinator, Environmental Protection Agency (EPA) (82,500), the Department of Transportation's TRIS-on-Line (70,000) and EPA's Solid Waste Information Retrieval System (42,000).

Several agencies participated actively in internationally cooperative activities in building their data bases. The National Library of Medicine, in its bilateral arrangements, received input to its MEDLARS data base from England, Sweden, France, Germany, Japan, Australia and South Africa.

Some agencies participated in multilateral agreements as well. ERDA continued its cooperation with the International Atomic Energy Agency in the development of the International Nuclear Information System (INIS). As a result ERDA had access to 37,500 abstracts contributed by other countries to the INIS data base. The National Oceanic and Atmospheric Administration (NOAA), in cooperation with the Food and Agriculture Organization of the United Nations (FAO), participated actively during the year in the development of the Aquatic Sciences and Fisheries Information System (ASFIS). Other participating countries were Germany, France, United Kingdom, Canada and the U.S.S.R. The National Agricultural Library continued its limited participation in the Agricultural Research Information System (AGRIS) of FAO.

Published Abstracting, Indexing and Announcement Services

The most frequent product derived from the bibliographic data bases remained the published abstracting and indexing (A & I) or announcement service. Most were published monthly. NTIS was an exception. Its *Government Reports Announcements* and *Weekly Government Abstracts* were published on a biweekly and weekly basis, respectively. The National Library of Medicine had the largest coverage with 267,000 journal articles in the *Index Medicus* in 1976. NTIS cited 100,000 entries in its two announcement services; NASA referenced some 60,000 in *Scientific and Technical Aerospace Reports* (STAR) and *International Aerospace Abstracts* of the American Institute of Aeronautics and Astronautics.

During the year, ERDA's *Nuclear Science Abstracts* was discontinued after publishing 947,000 abstracts in its career. Substituted for it was ERDA's *Energy Research Abstracts*, which published 26,932 items in its first full year, and the *INIS Atomindex* of the International Atomic Energy Agency in Vienna, to which ERDA contributed 22,715 items. Also discontinued, but without provision for substitute, was EPA's *Air Pollution Abstracts*, after publishing 82,500 abstracts in its field.

The practice of deriving multiple specialized published services from large comprehensive data bases became more common. Thus, in addition to *Energy Research Abstracts* and its contributions to *Atomindex*, ERDA produced six specialized abstracting and indexing journals from its Energy Information Data Base (EEDB) and published a series of bibliographies as well. The National Library of Medicine used its data base to publish the *Index Medicus*, the *Abridged Index Medicus* and its *Quarterly Current Catalog* and some 18 specialized indexes.

Most abstracting and indexing published were published through the Government Printing Office or the agency itself. Several were published in cooperation with scientific and professional societies and some, such as the Educational Resources Information Center's *Current Index to Journals in Education*, continued to be published by commercial publishers.

Search Services

On-line searching of Federal bases advanced in 1976. Many agencies arranged for on-line access through commercially available computer networks (notably Lockheed Information Systems, System Development Corporation and Bibliographic Retrieval Services, Inc.). Others established their own networks to promote search availability, while a few used both commercial services and in-house search capability to maximize the use of their data bases.

NOAA and EPA's Air Pollution Technical Information Center made their data bases available for search exclusively through commercial brokers. The National Institute of Education (NIE) reported the largest number of tape subscribers. In addition to System Development Corporation and Lockheed, about 500 organizations purchased ERIC tapes as well. The Defense Logistics Agency and its Defense Documentation Center depended on the Department of Defense (DOD) resources, in cooperation with those of ERDA and NASA for provision of on-line searching of its data base. In 1976, the Defense RDT&E On-Line System (DROLS) was accessible through 92 remote terminals located in DOD agencies and laboratories, NASA, ERDA and contractor-related facilities.

The National Library of Medicine's MEDLINE system was available through 666 remote terminals located in medical school libraries, research laboratories and other Government agencies. ERDA and NASA used the RECON on-line search software developed by the latter, as did Interior's Office of Water Research and Technology (OWRT). ERDA reported 158 remote terminals in operation, while NASA and OWRT reported 45 and 11 respectively in their agency-controlled computer search networks.

Use of the National Criminal Justice Reference Service supported by the Department of Justice's data base, which conducted 7,500 searches in 1976, was controlled by the Department.

On the other hand, although the National Agricultural Library made its AGRICOLA data base available for search through a commercial broker, the Agricultural Research Service made heavy use of this data base in-house. Approximately 14,000 SDI profile searches were performed for 1,600 Department of Agriculture scientists in 1976. The heaviest use of a data base was recorded by NTIS, which supplemented the estimated 2,500,000 searches accomplished by data base leasors with 358,000 in-house NTIS searches.

Document Supply Services

Federal agency information retrieval systems have evolved along two lines: (a) management of the conventionally published literature; and (b) management of the technical report literature. The former is addressed mainly by decentralized technical libraries and information centers which distribute documents through inter-library loan and photocopy services. The latter has developed centralized document reproduction and distribution capabilities. There are, of course,

exceptions--systems which process both the published and the report literature, such as ERIC, and systems which are partially decentralized; however, the pattern generally prevails.

Each of the three national libraries--the Library of Congress, the National Agricultural Library and the National Library of Medicine--stands at the pinnacle of a library-based network of document delivery services. The most informally structured network is that of the country's research libraries, for which the *National Union Catalog* and related activities of the Library of Congress serve as switching mechanisms. With a view to a more formal structure, the National Commission on Libraries and Information Science (NCLIS) has sponsored a study of the role of the Library of Congress in a national network.

The National Agricultural Library has organized a service network involving the libraries of the land grant colleges in serving the information needs of agricultural researchers in over 20 states. With its 1,548,028 titles, the National Agricultural Library stands at the apex of this network, backstopping its document delivery activities.

Most highly structured is the hierarchical Biomedical Communications Network (BCN), established by the National Library of Medicine (NLM) under the Medical Library Assistance Act of 1965. Eleven regional libraries (several of which are library consortia) are under contract to coordinate medical library services of 117 "resource" libraries of the medical schools and some 7,200 health science libraries throughout the 50 states. The NLM interacts with the regional libraries and services to backstop them, supplying loans or photocopies of 185,000 documents in 1976 to supplement the network's own efforts.

Other significant library-based document delivery networks include those of the National Natural Resources Library and Information System (Department of the Interior), which assists over 400 libraries and information centers; the Department of Housing and Urban Development, which coordinates library services at its 10 regional offices; and the Veterans' Administration, whose headquarters library serves as a focus of a network of 30 VA hospital libraries. NASA supplements its document delivery service with a NASA-wide library network, NALNET, which coordinates the services of 11 NASA center libraries and the headquarters library; the Environmental Protection Agency has taken the first steps toward the establishment of a national network of environmental libraries.

Of the agencies which centralize the distribution of documents, the Government Printing Office (GPO) and the U.S. Patent and Trademark Office remained strongholds of paper-copy distribution, although microforms made inroads. In 1976, GPO distributed 90 million printed publications; it also reported experimenting with a microfiche edition of the *Code of Federal Regulations* and with the *Documents' Master Publications Reference File* in a 48:1 reduction ratio microfiche format. The U.S. Patent and Trademark Office sold 5,000,000 patent documents in printed form. However, NTIS marketed the Office's classification data files on 16mm microfilm.

At the head of the list of agencies using microfiche for document distribution is ERIC within the National Institute of Education. ERIC, with its combined standing order and request distribution, sold 17 million copies of documents in 1976 with over 99% of these in microfiche. The Energy Research and Development Administration distributed 535,000 copies of reports without charge and sold 4,600,000 for a total of 5,135,000. Four percent of these were in paper copy; 96% were microfiche.

NTIS sold a total of 3,228,218 documents in 1976 of which 78% were microfiche. NASA distributed 3,310,568 copies of documents to 1,100 organizations. 80% of these were microfiche. Of the NASA total, 2,967,511 copies were distributed without charge to NASA facilities and contractors, educational institutions and other Government agencies; 343,057 copies were sold.

The Defense Documentation Center (DDC) distributed 636,550 copies of documents, primarily to other Defense installations and contractors. Of this total, 358,817 were furnished without charge, and 277,733 were sold; 81.4% of the copies supplied by DDC were microfiche.

Federal information systems under development also reported a preference for microfiche. The Agency for International Development's Technical Assistance Bureau intends to use microfiche to disseminate the report literature of economic and social development to U.S. users and to national and international organizations. In the Transportation Research Information Services Network (TRISNET) under study at the Department of Transportation, microfiche is being considered as a means of distributing copies of the 500,000 documents now represented in the TRISNET data base.

Research in Progress Services

Closely related to the bibliographic data bases are the data bases comprising information about ongoing research. The best known of these is the Smithsonian Science Information Exchange (SSIE), which reported usage by over 500 organizations in 1976. SSIE processed 122,937 Notices of Research Projects (NRP's) into its data base during 1976, and 9,374 subject searches were conducted. SSIE also reported the preparation of 101 tabulations, compilations, special listings and directories which represent a major part of the Exchange's efforts and user income. Approximately 84,000 copies of publications containing 30,000,000 NRP's were distributed in 1976; an additional 40,000 projects were disseminated in magnetic tape format. The estimated total of NRP's disseminated during 1976 was 34,061,189. The Current Research Information Service (CRIS) of the Department of Agriculture has a data base of 24,000 ongoing Department research projects supplemented by 8,000 locally funded projects. The Defense Logistics Agency maintains a DOD Research and Technology Work Unit Data Bank comprising some 20,000 active and 80,000 completed records of development projects. Limited in use to Defense agencies only, it recorded nearly 12,000 uses in 1976. The Department of Transportation concentrated on the development of a management information system (incorporating information on ongoing research) known as TRAIS (Transportation Research Activities Information System).

Numeric Data Bases

While the Federal Government research and development agencies constitute without doubt the world's largest generators, collectors, processors and custodians of non-bibliographical scientific and technical data, services ensuring their availability are less developed than those in the bibliographic field.

The National Bureau of Standards (NBS) has the primary responsibility in the Federal Government for promoting and coordinating the critical evaluation of numerical data in the physical sciences. Activities of its Office of Standard Reference Data were restructured in 1976 along application rather than disciplinary lines, resulting in four programs--energy and environmental data, industrial process data, materials utilization data and physical sciences data. Results are published in cooperation with the American Institute of

Physics and the American Chemical Society in the *Journal of Physical and Chemical Reference Data*. NBS arranges for a wide variety of other publications as well.

The National Oceanic and Atmospheric Administration constitutes a second major Federal program for the collection, processing and servicing of numerical data. In NOAA's case, much of the data is time and place dependent--meteorological, climatological, atmospherical, geological. Of particular interest in the NOAA programs is acceptance of responsibility for the U.S. contribution to global cooperative programs for numerical data handling in such scientific areas as glaciology, seismology, solid earth geophysics and the like. A number of these activities are undertaken in cooperation with the International Council of Scientific Unions.

Another major program for numerical data processing and service is conducted by NASA through its National Space Science Data Center (NSSDC) in Greenbelt, Maryland. The NSSDC Program also has an international dimension; it operates the World Data Center for Rockets and Satellites, collaborates with the Committee on Space Research (COSPAR) of the International Council of Scientific Unions in the dissemination of data on satellite launches and produces a series of specialized reports. Of technical interest is NASA's experimental "tagging and flagging" program, designed to identify significant and useable numerical data content of documents entering NASA's bibliographic data base.

Reference to many other numerical data bases will be found in the reports of other agencies--the Department of Defense, Housing and Urban Development, Interior and Transportation. While an exhaustive inventory of federally generated numerical bases and their availability has yet to be made, NTIS published a *Directory of Computerized Data Files, Software and Related Technical Reports* (3rd edition, 1976), a comprehensive listing of 1,200 entries which includes descriptions of 274 machine-readable federally maintained numerical data files in fields of science and technology. In addition to this published source, ERDA's Office of Environmental Information Systems reports the availability for on-line search of a National Catalog of Data Bases and Models, which lists 4,000 data bases and 4,000 models related to energy and the environment.

TECHNOLOGY TRANSFER

All the Federal research and development agencies reported being involved in the transfer of new scientific and technical information to their respective non-governmental constituencies. Some agencies with strong industrial orientation concentrated on technology transfer to the industrial sector.

The Department of the Army, the Navy and the Air Force and the Defense Documentation Center operate a complex of technological information programs. Beneficiaries include DOD agencies and laboratories, as well as the defense-associated industry. Over recent years special attention has been paid to the transfer of information to and among Defense contractors.

Perhaps the best known of these programs is the Government-Industry Data Exchange Program (GIDEP), headquartered in the Navy Material Command. Participation in GIDEP, with its data banks (Engineering, Failure Experience, Failure Rate and Metrology) is mandatory for all Defense agencies and NASA; other participants include other U.S. Government agencies, industrial and commercial establishments and the Canadian Department of Defense.

The Navy's Navy/Industry Cooperative Research and Development (NICRAD) program has as an operating arm the Navy Research and Development Information Centers (NARDIC), through which research and development information on planning and requirements is made available to small business, industry, universities and nonprofit institutions. Other features of the Navy's technology transfer program will be found in its report.

The Air Force enlarged its Information for Industry program in 1976, establishing three regional offices. In cooperation with the Small Business Administration, the Air Force operates a Technology Application and Utilization program to assist small business through providing access to Air Force-funded new technology.

In addition to its participation in GIDEP, the Army reports the provision of services to the industrial public from its seven Technical Information Analysis Centers, which review technological developments in specialized fields. Finally, services from DDC itself and its nine contractor-operated Information Analysis Centers (IAC's) are available to Defense contractors and to other Government agencies.

On the civilian side, NASA's technical information program is associated with the NASA Office of Industry Affairs and Technology Utilization. A principal mission of NASA's Scientific and Technical Information Office is the support of the agency's Technology Utilization Program. Under this program, NASA contracts with universities and nonprofit research institutes for the operation of six regional Industrial Application Centers. NASA *Tech Briefs*, containing announcements of new technology, are distributed to 30,000 subscribers. The NASA data bank, available for search also at NASA's Computer Software Library, University of Georgia, includes some 8,000,000 records of available technology for industrial use. Each of NASA's ten field offices has a Technology Utilization Officer who functions to provide information on technology applicable to specific manufacturing problems.

The EPA Technology Transfer Program has directed its efforts toward meeting the needs of a mixed user group, in part industrial and in part locally governmental. Its objectives are to assist industry in technological advances in reducing industrial pollution and to help State and local government officials apply technology to improve the environment. To this end, the EPA opened an Environmental Research Information Center in Cincinnati in 1976.

The National Technical Information Service supports the transfer of new technological information created with Federal funds to commerce and industry. Its basic bibliographical services to industry were supplemented in 1976 by a new Federal Laboratories/Industry Information Referral Service intended to provide direct contact between small and medium sized industries and Government specialists. University Extension Centers supported by the Economic Development Administration, Department of Commerce, are used to channel industrial requirements to NTIS.

In addition, NTIS, in conjunction with field offices of the Department of Commerce, held 30 seminars and workshops throughout the country to inform special interest groups of the availability of information services.

Finally, as a major contribution to the transfer of Government-generated technology to the private sector, in 1976 NTIS worked to prepare a comprehensive *U.S. Government Patent Portfolio* for publication in 1977. The portfolio will list 16,000 Government patents issued between 1966 and 1974 which are available for the use of private industry.

Services to Congress

A significant development during 1976 was the expansion of on-line information retrieval services to Congress based on the Library of Congress' SCORPIO system. A

majority of Senate offices and 208 House offices have installed consoles permitting access by members of Congress and their staffs to six files--legislative information on bills of the 93rd and the 94th Congress, updated information on over 200 major issues, bibliographic citations of concern to the Congress, the National Referral Center's resources of specialized information sources and the Library of Congress Computerized Catalog.

In addition, more than 130 House offices have contracted with private time-sharing companies for access to other data bases.

The Congressional Research Service conducted a user survey of 30 Senate offices in 1976 for the Senate Committee on Rules and Administration[6]. Half of the 30 offices surveyed used the current "bill digest" file (CG93) on a daily basis.

[6] U.S. Senate. Committee on Rules and Administration. Sub-committee on Computer Services. Information Support for the U.S. Senate: A Survey of Computerized CRS Resources and Services. Washington, GPO, 1977. (Committee print)

SELECTED MULTI-SERVICE PROGRAMS

	A & I Services	Search Services	Document Repro/ Dissem.	Research in Progress	Analysis Centers	Numerical Data
DEPARTMENT OF AGRICULTURE						
• Agricultural Research Service		x	x			
• Current Research Information System		x				
• Forest Service (FIREBASE)		x	x			x
• National Agricultural Library	x	x	x			
DEPARTMENT OF COMMERCE						
• National Bureau of Standards	x	x			x	x
• National Oceanic and Atmospheric Administration	x	x	x	x	x	x
• National Technical Information Service	x	x	x			
• U.S. Patent and Trademark Office	x	x	x	x	x	x
DEPARTMENT OF DEFENSE						
• Defense Logistics Agency	x	x	x	x	x	
• Department of the Air Force	x	x			x	x
• Department of the Army	x	x			x	x
• Department of the Navy	x	x			x	x
DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE						
• Alcohol, Drug Abuse, and Mental Health Adm.	x	x	x		x	
• Health Resources Adm.	x	x	x			
• National Institute of Education	x	x	x		x	
• National Library of Medicine	x	x	x	x		
DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT						
• Library Division	x	x	x			
• Office of International Affairs	x	x	x	x		x
DEPARTMENT OF INTERIOR						
• Bureau of Mines	x		x	x	x	x
• Bureau of Outdoor Recreation		x	x			
• Office of Library and Information Service	x	x	x			
• Office of Water Research and Technology	x	x		x		
• U.S. Geological Survey			x	x		x
DEPARTMENT OF JUSTICE						
• Law Enforcement Assistance Adm.	x	x	x			
DEPARTMENT OF STATE						
• Agency for International Development	x	x	x	x	x	
DEPARTMENT OF TRANSPORTATION	x	x	x	x		x
ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION						
• Environmental Information System	x	x	x	x	x	x
• Office of Technical Information	x	x	x	x	x	
ENVIRONMENTAL PROTECTION AGENCY						
• ONAC Noise Information System		x	x			
• Pesticide Information Center	x	x	x			
• Solid Waste Information Retrieval System	x	x				
FEDERAL ENERGY ADMINISTRATION	x	x	x	x		x
GENERAL SERVICES ADMINISTRATION						x
GOVERNMENT PRINTING OFFICE	x		x			
LIBRARY OF CONGRESS	x	x	x			
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION	x	x	x	x	x	
SMITHSONIAN SCIENCE INFORMATION EXCHANGE, INC.	x	x	x	x	x	
VETERANS ADMINISTRATION		x	x			x

FEDERAL AGENCY
SCIENTIFIC AND TECHNICAL
INFORMATION ACTIVITIES

DEPARTMENT OF AGRICULTURE

The mission of the United States Department of Agriculture (USDA) is to enable those engaged in the production, processing and marketing of agricultural products to efficiently meet the food and fiber needs of the public. Furthermore, this mission includes bringing a fair share of economic and social returns to producers and marketers for their investment and labor; developing the Nation's renewable resources; improving the resource management and conservation in the developing nations of the world; and strengthening world markets for food, fiber and natural resource products.

AGRICULTURAL RESEARCH SERVICE

At present, a total of nine data bases provide selective dissemination of information (SDI) and retrospective search services to more than 1,600 scientists in USDA. More than 14,000 SDI profiles are run on the following data bases: Biological Abstracts/BioResearch Index (BA Previews), Chemical Abstracts, Commonwealth Agricultural Bureau, Engineering Index, Food Science and Technology Abstracts, Government Reports Announcements, National Agricultural Library (CAIN), World Textile Abstracts. The Commonwealth Agricultural Bureau (United Kingdom) full data base was added to the Agricultural Research Service's (ARS) computer-based Current Awareness Literature Service in 1975.

Retrospective searches are furnished on a monthly basis; approximately 100 searches are run each month. Coverage of the back files varies from 1970 to date for BIOSIS, Chemical Abstracts and CAIN to 1972 or later for the other files. Citation printouts sent to scientists include preprinted library loan forms allowing the user to directly request copies. By submitting the printout to his nearest land grant college library or to the National Agricultural Library, the user can request a copy which will be sent to him at no charge.

In cooperation with the University of Hawaii (Department of Agronomy), ARS is conducting a program to analyze the range and secondary coverage of tropical agricultural literature. Additionally, the study provides for the implementation of a computerized information dissemination program utilizing Biological Abstracts/BioResearch Index, Chemical Abstracts, CAIN and Food Science and Technology Abstracts. An evaluation of this service will be undertaken in 1977.

ARS also provides computer and technical support to individual USDA scientists who have bibliographic files for which data processing services are desired. This support includes, when necessary, the conversion of these files into machine-readable format with a directory of such files to be produced in 1977 and to be updated as needed. Among these 25 to 30 specialized reference files is the *Directory of ARS-Authored Publications*, which includes all ARS-authored papers regardless of source. A project also is in progress to convert the retrospective files of ARS-authored citations to machine-readable form. This activity, to be completed in 1977, will include a considerable number of citations that predate the establishment of ARS in 1953. Concurrently, an ongoing indexing study will result in the development of an interdisciplinary thesaurus to be used to index and search the ARS citation file.

In addition to the keywords, citations will also include ARS National Research Program (NRP) designations and Current Research Information System (CRIS) Work Reporting Units (WRU). The file is updated quarterly and distributed to users in government and industry. Custom searches are run on demand. For further information, contact: Hilary D. Burton, Data Systems Application Division, Agricultural Research Service, Department of Agriculture, NAL Building, Beltsville, Maryland 20705, (301) 344-3817.

CURRENT RESEARCH INFORMATION SYSTEM

The Current Research Information System (CRIS) is a computerized data base which serves as the documentation and reporting system for USDA research projects and provides technical information to research scientists and current, coordinated program planning information to research managers. CRIS, which became fully operational in 1969, consists of data on 24,000 existing research projects. All research sponsored or conducted by the following six USDA agencies must be documented in CRIS:

- Agricultural Research Service
- Cooperative State Research Service
- Economic Research Service
- Farmer Cooperative Service
- Forest Service
- Statistical Reporting Service.

Included are data on 8,000 non-USDA funded projects which are provided voluntarily by 55 State Agricultural Experiment Stations, 15 Forestry Schools, 18 Land Grant Colleges of 1890 and Tuskegee Institute.

In 1976, approximately 2,000 new projects were added to the system and 2,000 were purged. Additionally, over 2,400 Information Requests (1,800 technical and 600 management) were processed. For the ninth consecutive year, the *Inventory of Agricultural Research* was published. Moreover, a CRIS Keyword Bank was produced and distributed to both Federal and State users.

The CRIS technical data base has been on-line for in-house use since July 1976. This interactive capability has been quite successful and will enable direct access by par-

ticipating Federal-State agricultural research organizations in 1977.

Also during 1976, CRIS began a project to redesign all input forms; the major changes consisted of increasing the maximum number of investigators per project from three to six, allowing an unlimited number of publications to be reported for each project, and greatly expanding special classification capability, including a new Energy Research and Development category.

Another activity during the year included a cooperation agreement with the State of Victoria in Australia which resulted in the development of a Victorian Agricultural Management Information System (VAMIS). Because VAMIS was patterned on the CRIS classification scheme, a great degree of compatability between the two systems was ensured.

Finally, the CRIS Operations Council, consisting of four USDA and four State representatives, has been quite successful in improving the timeliness and accuracy of data being submitted to CRIS and in making the system more responsive to the needs of Federal and State users. For further information, contact: John R. Myers, Director, Current Research Information System, Department of Agriculture, Room 6818, South Building, Washington, D.C. 20250, (202) 447-7273.

FOREST SERVICE

The Renewable Resources Technical Information System (RRTIS) is being developed by USDA's Forest Service in cooperation with other agencies. RRTIS aims to meet the needs of all professionals concerned with renewable technical information.

Teamwork is the key to successful development of RRTIS. The Forest Service is working with the Department of the Interior's Fish and Wildlife Service to develop new data bases on endangered species, on important species of game and non-game and on wildlife in important forest and range ecosystems. A cooperative effort exists with the Interior's Bureau of Land Management in the creation of FIREBASE, a computer-assisted, bibliographic reference service concentrating on all aspects of forest and range fires. Finally, with the Environmental Protection Agency, the Forest Service provides for the funding of a special library service called SEAMINFO, which will provide current awareness services, a computerized data base and document delivery on the scientific and technical information related to reclamation of mined land.

Additionally, RRTIS is concerned with multi-media materials including conventional documents as well as those non-conventional materials that are of great value to practitioners concerned with managing natural resources. However, numeric and geographic data are not included. Furthermore, regional brokerage services will be an important part of RRTIS. One such service is PACFORNET (Pacific Coast Forestry Information Network) which is now operational, while possibilities for creating a WESTFORNET and SOUTHFORNET are being studied. The Forest Service is also working closely with AGRIS Forestry, an international agricultural information system developed by UNESCO's Food and Agriculture Organization (FAO). RRTIS' goal is to become a widely used and integral part of a worldwide forestry information network in the 1980's. For further information, contact: Mary O'Hara, U.S. Forest Service, Room 808 RP-E, Washington, D.C. 20013, (202) 235-1293.

NATIONAL AGRICULTURAL LIBRARY

Dissemination of information about agricultural literature is a primary mission of the National Agricultural Library (NAL). The NAL bibliographic data bases in machine-readable form were renamed AGRICOLA (AGRICultural On-Line Access) in July 1976. AGRICOLA is an umbrella term encompassing a family of data bases which provides for the information needs of NAL clientele. CAIN (CAtaloging-INdexing) is the bibliographic record of journal articles, new monographs and new serial titles received at NAL, and with a total of 864,400 references constitutes the bulk of the AGRICOLA file. The Food and Nutrition Information and Educational Materials Center (FNIC) file is a machine-readable cumulation of citations (presently 10,354) to journal articles, monographs and audiovisual materials. FNIC subject areas include applied human nutrition, food service sanitation and safety, volume food storage and preparation and administrative material. The Agricultural Economics (AGECON) data base contains 5,079 bibliographic citations published in the *American Bibliography of Agricultural Economics*. AGRICOLA is on-line with Lockheed Information Services, System Development Corporation and Bibliographic Retrieval Services. As the need arises, AGRICOLA will acquire additional data bases.

The National Agricultural Library and Cornell University Libraries signed a cooperative agreement for the addition of bibliographic records of agricultural serials and journals to the CONversion of SERials (CONSER) data base. CONSER is a joint project of the Library of Congress, the National Library of Canada and other major research libraries, under the management of the Council on Library Resources. Because Cornell and NAL hold extensive collections of agricultural serials and share many titles in common, this cooperative effort will improve access to this important body of literature as well as reduce duplication of effort for countries throughout the world. Under the agreement, NAL contributed funds to partially defray the cost of the work performed while Cornell converts the record of titles in its Albert R. Mann Library collection to CONSER standards. This collection specializes in such subjects as agricultural engineering, agricultural economics, rural sociology, biological sciences, food science, plant science, human ecology and natural resources. Additionally, veterinary titles in the College of Veterinary Medicine Library will also be converted.

In 1974, NAL began active participation in the Ohio College Library Center (OCLC) through the Federal Library Committee's Federal Library and Information Network (FEDLINK). The Library's participation was initially limited to the first subsystem, i.e., an on-line union catalog and shared cataloging. Participation has now been extended to the Serials Control Subsystem. Moreover, when the check-in component became partially operational during 1976, NAL began a pilot project to study the desirability of using this system for maintaining records of its approximately 20,000 currently received serials. From May 1976 until the end of the year, nearly 2,400 check-in records have been established in OCLC. These records represent all copies received of almost 1,500 serial titles which were checked in through the Serials Control Subsystem. NAL's holdings of books, journals, pamphlets and related materials are now approaching 1,600,000 titles. For further information, contact: Office of the Director, National Agriculture Library, U.S. Department of Agriculture, Beltsville, Maryland 20705, (301) 344-3778.

DEPARTMENT OF COMMERCE
NATIONAL BUREAU OF STANDARDS

The National Bureau of Standards (NBS), created by Congress in 1901, provides scientific and technical support to industry, commerce and government. Its functions include maintenance and improvement of the national standards of measurement, and a comprehensive range of activities in engineering and the physical sciences to meet the technical needs of Government agencies, scientific institutions and industrial enterprises.

NBS' Office of the Associate Director for Information Programs promotes the optimum dissemination of all scientific and technical information to the staff, sponsors and customers of NBS, and to the interested public.

OFFICE OF TECHNICAL PUBLICATION

NBS' scientific and technical information publications include the Bureau's 14 publications series (11 nonperiodical and 3 periodical), bibliographic subscription services, the *Journal of Physical and Chemical Reference Data* (published quarterly for NBS by the American Institute of Physics and the American Chemical Society), and outside scientific and technological journals. Through these communication channels, the Bureau published in 1976 some 40,000 pages of material tailored for the Bureau's many audiences. At the close of 1976, NBS contributions to the open literature totalled about 646,000 printed pages.

Since the mid-1960's, the Bureau's traditional audience of scientists, engineers and Government has expanded to include educators, economists, environmentalists, the business community, energy conservationists, safety experts and law enforcement officials. In addition, the Bureau focuses on the general public as an audience. To meet this expansion, the NBS Office of Technical Publications is utilizing other Government information facilities such as the National Technical Information Service, the Smithsonian Science Information Exchange, the Corono Government Industry Data Exchange Center and the Commerce Department's field offices.

NBS continues to work with the Commerce Department and the Government Printing Office to maximize the potential of computer-assisted composition. Computer-assisted photocomposition is being increasingly utilized to achieve reduced cost while maintaining high graphic arts quality. Additionally, an index of NBS publications for the last ten years has been made possible. Since NBS information usually has a long life cycle, this index will be genuinely useful to researchers.

One example of the Bureau's response to its consumer audience was its publication "Making the Most of Your Energy Dollars" which aroused great interest and acceptance from the general public, utilities, business and Federal agencies. Bureau publications now include outputs addressed to all levels of energy users (the scientist, factory manager, the layman); those concerned with air, water and noise pollution; fire researchers; product safety specialists; law enforcement organizations; and those engaged in the implementation of metric conversion. The Bureau's Correspondence and Inquiry Unit further complements the Publications Program efforts by responding to approximately 90,000 telephone and letter queries annually.

CENTRAL LIBRARY

One of the largest Federal collections of literature in the field of science and technology is contained in the NBS main library. In addition to the usual library materials, the library provides reference services and extensive literature search capabilities, both manual and computer-assisted. The library also functions as a referral service for public inquiries for information on areas covered by NBS, if the latter cannot directly supply that information. Separate collections within the library include literature on energy conservation and standard reference data on the physical and chemical properties of materials.

INSTITUTE FOR APPLIED TECHNOLOGY

Weights and Measures Information

The Office of Weights and Measures is a focal point for information on weights and measures laws, regulations and technical requirements of Federal, State and local governments. The Office disseminates a wealth of historical and current documents, containing weights and measures information and data which cover such areas as the National Conference on Weights and Measures, Fair Packaging and Labeling Act, and commercial weighing and measuring devices and practices.

Engineering and Standards Information

NBS maintains in its Standards Application and Analysis Division (SAAD) an extensive reference collection of over 240,000 standards issued by U.S. technical societies; professional organizations; trade associations; State purchasing offices; U.S. Government agencies; and foreign, national and international standardizing bodies. This collection, which is known as the Standards Information Service (SIS), also includes on microfilm the Visual Search Microfilm File (VSMF) consisting of all Federal specifications and standards; Military specifications, standards, handbooks and

drawings; the standards of the International Organization for Standardizations (ISO) and the International Electrotechnical Commission (IEC), of nine major U.S. standards organizations, and of over 130 standards organizations in the construction industry. Also on microfilm are some 6,000 U.S. vendor catalogs and Federal Construction Regulations. Although a reader-printer is available to users visiting the facility for the microfilm portion of the collection, NBS/SIS does not sell or distribute any of the standards in the collection.

The purpose of SIS is to serve both as an information center and as a reference and referral activity to sources of standards. By means of Key-Word-in-Content (KWIC) indexes, the SIS staff answers more than 6,000 inquiries each year. SIS has compiled general and special indexes available from the National Technical Information Service (NTIS), U.S. Department of Commerce, Springfield, Virginia 22161, and from the Superintendent of Documents, U.S. Govenment Printing Office, Washington, D.C. 20402.

A data communication terminal is capable of on-line retrieval of information on the standards in the SIS collection through an in-house program; it can also access on-line systems outside of NBS.

Metric Information

A Metric Information activity serves as the principal focal point in the Federal Government for inquiries related to the metric system, metric conversion and the U.S. Metric Study. Informational materials related to these topics have been developed and are available to the public.

Consumer Product Information

The Center for Consumer Product Technology has developed nine test procedures for major household appliances. The procedures have been developed in response to the requirements of the Energy Policy and Conversion Act in cooperation with the Federal Energy Administration and the Federal Trade Commission. The ultimate outcome of the effort will be the appearance of information labels disclosing the energy efficiency of the appliance. The purchaser may then select the most energy efficient appliance meeting his needs.

NBS has undertaken the development of energy efficiency improvement targets for ten major household appliances. Each target aims for the maximum improvement in energy efficiency that is economically and technologically feasible for each type of appliance by 1980.

Building Research Information

The Center for Building Technology (CBT) has developed three companion reports covering the Center's activities--NBS Special Publication 439, *Center for Building Technology--a perspective*, NBS Special Publication 466 Supplment 1, *Building Technology Project Summaries*, and NBS Special Publication 457 Supplement 1, *Building Technology Publications*. The reports describe CBT's major programs and laboratory facilities, CBT's projects for CY 76, and CBT's published reports during 1976.

The Center for Building Technology uses a computerized mailing list of members of the building community to disseminate newsletters, press releases and reports describing the Center's research activities. The Center maintains an information service activity, aided by a limited inventory of Center-published documents, and a referral system to outside data sources.

Fire Research Information

The Center for Fire Research (CFR) operates one of the few libraries exclusively devoted to the special field of fire research. The library supports fire research and development efforts by providing searches of current and past fire literature, interlibrary loans and information dissemination services. *Fire Research Publications* is a yearly compilation of publications prepared by the Center staff, CFR-sponsored grantees and contractors, and NSF Research Applied to National Needs fire research grantees. The Center also publishes FIREVIEW, a newsletter which is distributed to individuals interested in the Center's fire research program.

Semiconductor Technology Information

The Semiconductor Technology Program has a program brochure, two program progress reports (NBS Special Publications 400-19 and 400-25) and an updated list of program outputs (NBS List of Publications 72) concerning the measurement technology developed for specifying materials and devices and the control of electronic device fabrication processes. These documents are available to semiconductor electronics organizations and other interested groups. In addition, two videotape presentations (part of a projected series) on significant measurement method developments are available on loan.

NATIONAL STANDARD REFERENCE DATA SYSTEM

The formal existence of the National Standard Reference Data System (NSRDS) dates from 1963, when the Federal Council for Science and Technology asked the National Bureau of Standards to assume primary responsibility in the Federal Government for promoting and coordinating the critical evaluation of numerical data in the physical sciences. The Office of Standard Reference Data (OSRD), established at NBS to manage the program, performs several functions. The staff of the Office act as monitors for all projects which are supported. The management of the publications program of NSRDS is also in the hands of OSRD, as is the operation of an information service on a limited scale. In addition, OSRD maintains close contact with other data compilation activities, both in the United States and abroad.

In 1976, OSRD restructured its program along application lines rather than in accordance with scientific disciplines. Organizationally, the OSRD now consists of an overall management unit, four applications in the form of related data programs, an information service activity and a data systems design group. The four data programs are designated Energy and Environmental Data, Industrial Process Data, Materials Utilization Data and Physical Science Data. Briefly, the programs have the following contents:

- Energy and Environmental Data. Projects dealing with data that have an important application in some aspect of energy research and development or environmental quality improvement. Projects in chemical kinetics, nuclear properties, spectroscopic data and interaction of radiation with matter are currently incorporated in this program. The output of these projects is particularly important in research and development on new energy sources, environmental monitoring techniques and prediction of the effects of pollutants introduced into air, water or land.

- Industrial Process Data. Projects dealing with the thermodynamic transport and physical properties of industri-

ally important substances are included in this program. Such data have particular application to design of new processes in the chemical and metallurgical industries, optimization of currently used processes and general productivity enhancement.

- Materials Utilization Data. Properties required for material selection and research and development on new materials. The structural, optical, electronic, magnetic and mechanical properties of solid materials are included.

- Physical Sciences Data. Projects which involve basic data of very broad applicability, or which are associated with an important frontier field of science, are included in this program. Examples are fundamental physical constants, data on fundamental particles and data relevant to radioastronomy.

What the new organizational structure offers is a better, more readily identified match between the needs of outside users and the capabilities of NSRDS to supply reliable data relevant to major national problems. Taking full advantage of this match requires close interaction with data users and Federal agency representatives who are working to solve these national problems, as well as with data programs in other countries.

Evaluated data produced under the NSRDS program are disseminated through the following mechanisms:

- *Journal of Physical and Chemical Reference Data.* A quarterly journal containing data compilations and critical data reviews, published for the National Bureau of Standards by the American Institute of Physics and the American Chemical Society.

- NSRDS-NBS Series. A publication series distributed by the Superintendent of Documents, U.S. Government Printing Office.

- Appropriate publications of technical societies and commercial publishers.

- Response by OSRD and individual data centers to inquiries for specific data.

Specific highlights of the NSRDS program and of OSRD activities during 1976 include the following:

- Co-hosting a meeting on "Transport and Transformation of Pollutants on Land and in Water", May 11-13, 1976.

- Expansion of existing cooperative efforts with industrial data users.

- Development of recommendations for presentation and evaluation of data for additional technical subjects--Raman Spectroscopy and Mass Spectrometry.

- Compilation of numerical data on the elements for updating of the familiar "Wall Chart" versions of the Mendeleev periodic table.

- Organization and chairing of the Fifth Biennial CODATA Conference at Boulder, Colorado, June 28 through July 1, 1976.

- Assisting the U.S. Geological Survey in the establishment of a National Center for Thermodynamic Data of Minerals.

- Cosponsorship of the Fourth International CALPHAD (Calculations of Phase Diagrams) Meeting at NBS, August 13-22, 1975.

The following statistics identify the printed output of the NSRDS:

- Sixteen data compilations, covering 1,156 pages, published in the *Journal of Physical and Chemical Reference Data*.

- Nine other data compilations.

- Two Critical Surveys of Data Sources, covering corrosion and electrical and magnetic properties of metals.

- Six bibliographies, including a three-volume, 2,300-page *Bibliography of Infrared Spectroscopy*.

- One addition to the continuing series of translation of Russian data compilations.

- A "Contribution to Computer Typesetting Techniques: Table of Coordinates for Hershey's Repertory of Occidental Type Fonts and Graphic Symbols".

INSTITUTE FOR COMPUTER SCIENCES AND TECHNOLOGY

Computer Information

The Computer Information Section provides information services on computer programs which are available for sharing, exchange or purchase through commercial sources. The Section also provides advisory services on the application of its in-house, computer-based indexing system and answers inquiries in the area of the computer sciences and technology as its resources permit. Additionally, the Computer Sciences Section provides access to its holdings for interested professionals in other sections to conduct their own searches. The Section also maintains a collection on a current basis of approximately 75,000 items, including reports, books, journals, proceedings and microfiche on computer science and related subjects and approximately 75 directories of computer programs available for sharing or through commercial sources. Furthermore, the Section prepares computer-produced semiannual indexes to the collection and the bibliographic data for on-line access. Principal outputs of the Section are technical reports, state-of-the-art reviews, bibliographies and analytical and statistical reports on Federal computer use. A list of publications is available.

ADP Standards Development and Publications

As part of its activities in meeting the responsibilities assigned by Public Law 89-306, the Office of ADP Standards Management sponsored the development and issue of the Federal Information Processing Standards Publications (FIPS PUBS). FIPS PUBS has been updated to include the following categories:

- FIPS # 44 COBOL Coding Form

- FIPS # 45 Guide for the Development, Implementation, and Maintenance of Standards for the Representation of Computer Processed Data Elements

For more information concerning NBS, contact: Dr. Edward L. Brady, ADMIN A-505, National Bureau of Standards, Washington, D.C. 20234, (301) 921-3641.

NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

The mission of the National Oceanic and Atmospheric Administration (NOAA) is to further the nation's safety, welfare, security and commerce through increasing knowledge and rational use of the natural environment. This mission further involves the following:

- The development of programs to assure the wise use of the ocean environment and its resources
- The execution of such programs so that the ocean resources can be effectively developed by the private sector
- The development and operation of systems to monitor and predict environmental conditions so that through information services and hazard warnings, life and property are protected and the efficiency of activities is improved
- The exploration of the feasibility and, where warranted, the development of a national capability for beneficial environmental modification.

The major components of NOAA are the following:

- Environmental Data Service (EDS)
- Environmental Research Laboratories
- National Environmental Satellite Service
- National Marine Fisheries Service
- National Ocean Survey
- National Weather Service

ENVIRONMENTAL DATA SERVICE

Environmental Science Information Center

The Environmental Science Information Center (ESIC), the Environmental Protection Agency (EPA) and the Department of the Interior initiated the bimonthly *Environmental and Natural Resources Information Newsletter*, which fosters cooperation among organizations involved in furnishing information on the environment and natural resources. Copies of the newsletter's prototype issue were distributed at the Federal Interagency Library Workshop in October of 1976. Editorship and production will be shared on a rotating, annual basis among the participating agencies, with NOAA as the lead-off agency. Eventually, circulation is planned to be about 3,000 copies (i.e., approximately 2,000 to elements of the Federal agencies and 1,000 to libraries and information centers at state and local levels, as well as to universities with Sea Grant support).

A major step completed during the year was the relocation and regrouping of the Library and Information Services Division of ESIC. Service centers (including pertinent collections of books, serials, microforms, etc.) remain at five NOAA locations in the Washington, D.C. area. However, the headquarters and input functions and the great majority of the holdings have been consolidated in the ESIC facility located at Building 4 of the Washington Science Center, Rockville, Maryland.

During 1976, there was considerable progress in improving the *Aquatic Sciences and Fisheries Abstracts* (ASFA), an international information journal and data base for the science and technology of marine and freshwater environments. ASFA is a module of the Aquatic Sciences and Fisheries Information System (ASFIS), a program developed jointly by the Food and Agriculture Organization of the United Nations (FAO) and the Intergovernmental Oceanographic Commission (IOC) of UNESCO. Since 1973, NOAA has collaborated with organizations in the Federal Republic of Germany, France, United Kingdom and the U.S.S.R to further the development of ASFA. In addition, Canada became associated with the project in 1976.

Another cooperative effort resulted in a computer-searchable version of ASFA. The Institut fur Dokumentationswesen of Frankfurt, with support from the West German Government, prepared a test file of 6,854 references, equivalent to the coverage of the first 6 months of the 1975 issues. In the United States, the Environmental Data Service sponsored the availability of this test data base to the public through the DIALOG on-line information retrieval service operated by the Lockheed Corporation in Palo Alto, California. Thus, ASFA joins *Oceanic Abstracts*, with its 83,000 citations, and *Meteorological and Geoastrophysical Abstracts* (50,000 citations) in the Lockheed service as a part of Oceanic and Atmospheric Scientific Information System (OASIS). Users of DIALOG will find that ASFA is now available as File 44. NOAA personnel are able to access these data bases through a network of 35 terminals. Others who wish to search ASFA may direct their requests to the User Services Branch (D822) of EDS' Environmental Science Information Center, or to any other center that services OASIS requests.

The 1976 grant from the United Nations Environment Program (UNEP) supported the automation of ASFA, the thesaurus development and other ASFA-related projects.

Center for Experiment Design and Data Analysis

During the Global Atmospheric Research Program (GARP) Atlantic Tropical Experiment (GATE), the Center for Experiment Design and Data Analysis processed data collected by United States ships and now archived at WDC-A, National Climatic Center (NCC), Asheville, N.C. These data include digital radar data, tethered balloon meteorological data, upper air rawinsonde data, high-resolution surface meteorological data and subsurface oceanographic data. Additionally, the data are archived on 250 magnetic tapes with auxiliary data sets available on microfilm.

Center for Climatic and Environmental Assessment

The Center for Climatic and Environmental Assessment (CCEA) has developed and tested initial energy/climate models for three states--Missouri, North Carolina and Georgia. In cooperation with Dr. Richard Lehman of the Department of Commerce, the Center has completed an operational program for generating seasonal estimates of natural gas requirements. This technique uses a ratio approach which measures in percentages the departure from last year's gas consumption according to regions. Furthermore, the facility provided these results to the Secretary of Commerce and the Federal Energy Administration.

The Center for Climatic and Environmental Assessment is preparing and distributing a weekly global assessment of the impact of climatic variations on the progress of the crop growing season. An abbreviated 2- to 3-page summary report highlights significant variations from normal weather in order to present a quick assessment of the world's climatic areas.

National Climatic Center

The National Climatic Center (NCC) planned and participated in three workshops during 1976--Climatological Data Users' Workshop, in April, cosponsored with the National Science Foundation (NSF); a Climate and Health Workshop, in June, cosponsored with the Environmental Protection Agency (EPA) and the U.S. Department of Health, Education, and Welfare; and a workshop for non-Federal State climatologists, in October, hosted by NCC.

NCC continued its program to film vital past weather records and serial NOAA climatological publications. By the end of 1976, the Center reduced nearly 4.5 million pages of records and publications to 46,000 microfiche which occupy about 1 percent of the space needed for the paper copy files. Users now have the option of purchasing duplicate microfiche at a cost less than paper copies made from the microfiche. Also, NCC established discount prices for selected sets of NOAA climatological publications on microfiche.

The Energy Research and Development Administration (ERDA) and the National Science Foundation found an NCC-initiated effort to rehabilitate the solar radiation data collected by the National Weather Service (NWS) and archived at NCC for the period 1951 through 1975. The effort also includes the removal of calibration and instrument deterioration errors so that the historical data will be of a quality comparable to those data which will be collected by the NWS' newly instrumented network starting in January 1977. The two sets of data will be merged with later data into a newly defined format (SOLMET) with collateral meteorological parameters such as wind, temperature, sunshine, clouds, etc., for use by solar energy scientists, architects and engineers.

The Archive of the International Field Year for the Great Lakes (IFYGL) at the National Climatic Center contains atmospheric, biological and water information about the Great Lakes, in particular, Lake Ontario. The basic data are on magnetic tape, and reports from the several hundred participating scientists are on microfiche. Indexes are available and a comprehensive catalog is nearing completion.

National Geophysical and Solar-Terrestrial Data Center

In response to the needs of the international scientific community for a means of self-coordination, the National Geophysical and Solar-Terrestrial Data Center (NGSDC) established a Temporary International Magnetospheric Study Central Information Exchange (TIMSCIE) office. TIMSCIE began publishing a monthly IMS Newsletter reporting on planned IMS activities worldwide. Knowledge of other planned activities for observing the Earth's magnetosphere has helped researchers in timing their experiments to coincide with other contemporaneous experiments.

On behalf of NGSDC, the University of Colorado's Institute for Arctic and Alpine Research (INSTAAR) will operate the World Data Center A (WDC-A) for Glaciology in the facility located at Boulder, Colorado. The WDC-A activity will publish a periodic "Glaciological Data" and will become generally more active, particularly in providing data services and products.

Seismic data exchange with the People's Republic of China has begun with the exchange of copies of seismograms for important earthquakes. Routine monthly and annual catalogs are also exchanged. Additionally, the classic "Catalog of Chinese Earthquake" includes reports from 1177 to 1900 A.D., the largest serial of observations in the world.

World Data Center A for Solid Earth Geophysics, operated by NGSDC, published a map of World Heat Flow values compiled by the International Heat Flow Commission. Publication of this map marks the first time ever these data have been compiled on a worldwide basis. The map depicts five color variations of world heat flow values, earthquake epicenters and volcanoes.

National Oceanographic Data Center

The National Oceanographic Data Center (NODC) provides the Bureau of Land Management (BLM), Environmental Protection Agency and National Science Foundation, as well as other NOAA components, with data management support. NODC also develops and maintains specialized data bases for the data collection programs of these agencies, e.g., the BLM Outer Continental Shelf Energy Program and the NSF International Decade of Ocean Exploration Program.

ENVIRONMENTAL RESEARCH LABORATORIES

Space Environment Laboratory Data Acquisition and Display System

A major new data base was established during the year, the Space Environment Laboratory Data Acquisition and Display System (SELDADS). This system is a real-time data collection and monitoring system for data on the solar-terrestrial environment. Data on solar activity from solar observatories around the world; solar X-ray data, proton and geomagnetic field data from four satellites; data on absorption of cosmic radio noise; and ground magnetic field variations from a ground based network are received in real time and processed by minicomputers. In addition, two 58-megabyte-discs maintain the data base which consists of the most recent 32-day cycle of data. Through the use of cathode ray tubes (CRT), strip charts, word messages or teleprinters, any or all of the data bases can be displayed. Data dissemination procedures encompass direct computer-to-computer links with the real-time data system user terminals, telephones and teletype reports. Furthermore, direct teletype access to the data base is available by telephone from anywhere in the world.

Alaska's Outer Continental Shelf Experiments

In pursuit of national energy independence, the search has turned toward oil reserves believed to lie beneath Alaska's Outer Continental Shelf (OCS). The Environmental Research Laboratories (ERL) is conducting a major environmental study for the Department of the Interior's Bureau of Land Management to determine the condition of this marine environment and its land forms, before oil industry development begins in Alaska. The principal activities of this program during the year have been to acquire a data base on the physical and biological components of the environment and to determine the transport processes influencing the distribution of potential contaminants from OCS development.

Remote Sensing Laser and Radar Technology Experiments

ERL's experiments in remote sensing laser, radar technology and aerosol analysis have resulted in a joint program with EPA for the identification and measurement of the concentration and dispersion of particulate pollution emitted by energy producing facilities such as power plants, strip mines and oil shale mines. Experimenters take lidar measurements of aerosol concentration, chemical and electron microscope analysis of aerosol composition, as well as radar measurements of the wind field aloft before and after the energy facility becomes operational. These results are used to determine the changes in particle pollution attributable to the facility.

Space Environment Laboratory

The Space Environment Laboratory (SEL) is participating in a joint program with the National Aeronautics and Space Administration (NASA) and the Max Planck Institute for Aeronomy in West Germany to construct and analyze data from measurement of the fluxes, energy and pitch angles of protons, electrons and heavier ions on the International Sun-Earth Explorer satellites. NASA plans to launch these satellites into the magnetosphere in 1977 for the purpose of separating spatial and temporal variations through the parameters measured. The flight unit has already been delivered to NASA for integration into the spacecraft.

International Magnetospheric Study

ERL is participating in the International Magnetospheric Study (IMS), an international cooperative enterprise under the auspices of the International Council of Scientific Unions. Over 40 countries participating in this 4-year program are attempting to achieve a comprehensive, quantitative understanding of the dynamic processes operating in the magnetosphere of the Earth's plasma and field environment. ERL's Space Environment Laboratory is responsible for relaying data in real time from some 25 magnetometers at remote locations in the polar regions through the NOAA geostationary satellites to the Boulder, Colorado information facility, where the data are passed on in near real time to a worldwide network of participating scientists. SEL is also constructing a state-of-the-art, computer-controlled research ionosonde for the use of the National Science Foundation during IMS. Subsequently scientists will analyze and interpret IMS data.

NATIONAL ENVIRONMENTAL SATELLITE SERVICE

With NASA's Synchronous Meteorological Satellite (SMS)-2 and Geostationary Operational Environmental Satellite (GOES)-1 as the operating satellites, the National Environmental Satellite Service (NESS) placed SMS-1 in standby status early in the year. Data from the geostationary satellites are now available to offices outside NOAA through the "GOES-TAP" system. This system allows other Government offices, professional groups, private enterprise and all others interested to receive any of the variety of standard GOES photographic products available at NESS field stations. Twenty affiliates now participate in this program.

NESS and NASA's Goddard Space Flight Center (GSFC) continue to cooperate in an effort to develop a Visible and Infrared Spin-Scan Radiometer (VISSR) Atmospheric Sounder (VAS). GOES-D, planned for launch in 1980, will carry the first of such instruments. NESS is also working with the GSFC on development of the third generation of polar orbiting satellites. The first of these satellites, NASA's TIROS-N, will be launched in mid-1978. Additionally, the second, NOAA-A, will follow approximately four months later. These two satellites, in combination with the GOES satellites, will be important elements in the international First GARP Global Experiment (FGGE).

NATIONAL MARINE FISHERIES SERVICE

Cooperative research and communication activities have involved the LANDSAT Menhaden and Thread Herring Investigation conducted by the National Marine Fisheries (NMFS) in conjunction with other Federal and State agencies and private industry. A brief field test was conducted in which LANDSAT I data were acquired, processed and analyzed, whereupon predictions of high probability fishing areas were supplied to the industry within 21 days of the satellite pass. Reports from the industry indicated that most of the predicted high probability fishing areas produced good fish catches. This research has demonstrated that the distribution of menhaden can be inferred from LANDSAT data with an accuracy approaching 90 percent.

The Inter-American Tropical Tuna Commission (IATTC) continues to analyze data from the NOAA satellite and "high gain" LANDSAT imagery. This information is correlated with *in-situ* oceanographic data to define the details of upwelling and frontal areas off the west coast of the United States. Working cooperatively with IATTC, the NMFS Southwest Fisheries Center is examining albacore/oceanography cruise data collected *in-situ* with concurrently corrected satellite data. The purpose of this study is to determine the feasibility of utilizing satellite information for identifying ocean frontal boundaries of the transition zone in the eastern North Pacific which appear to be associated with albacore migration.

NATIONAL OCEAN SURVEY

Oceanographic programs during 1976 included the assignment of important elements of NOAA's Ocean Dumping Program such as the development of baselines in selected dumpsite areas, processing and assessment of data and monitoring to the National Ocean Survey (NOS). The Marine Boundary and Tidal Datum Survey Program has progressed to the point where NOS has completed funding allocations

and agreements with Florida, South Carolina, New Jersey and California. In addition, other states have expressed interest in cooperating with NOS in this program.

The Marine Charting Automation Project has proceeded on schedule throughout the year. While shipboard automated systems continued to operate as in past years, the automated chart production systems were in transition from developmental to operational stages during 1976. Furthermore, NOS awarded a contract for the Automated Information System that will enable the cartographer to fully utilize charting information from a data bank.

In the area of improving nautical charts, NOS initiated the development of two depth sounding data acquisition systems, which, when implemented, will significantly improve the accuracy and dependability of the nautical chart. The first of these is the bathymetric swath survey system (BSSS), which utilizes a fan-shaped array of vertically directed sonar beams to completely map a large swath area beneath the survey ship. The width of such a swath covered by each passage of the sounding vessel is more than 2 1/2 times the depth of water beneath this ship. The second development is a program, the use of an aircraft-borne laser sounding system, conducted jointly with NASA and the Defense Mapping Agency. This system will survey hazardous shoal waters between the surf zone and depths of water up to ten meters.

Another cooperative program, initiated between NOS and the Geological Survey, produces combined topographic/bathymetric maps for coastal areas.

NATIONAL WEATHER SERVICE

The National Meteorological Center (NMC) realized significant advances in operational hurricane forecasting. An improved NMC model increased the accuracy of predicted hurricane movements and positions over 48 hours. Within this same time frame, quantitative precipitation predictions also improved significantly. Furthermore, this model was not restricted to hurricanes; it could also predict movement and positions of most well-developed storms moving over the United States. When the model was restricted, it could provide hydrological guidance in moderate-to-severe flooding situations (e.g., the guidance provided during the severe flooding of the Souris River in April 1976). NMC can implement this model whenever critical, large-scale weather situations pose a threat to the United States.

The National Weather Service (NWS) used newly developed Extended Streamflow Prediction (ESP) techniques in forecasting during the California drought. Application of the estimation theory for quantifying and reducing river flood forecast uncertainty initiated a coordinated research effort with outside consultants.

In the area of equipment systems, the Automation of Field Operations and Services (AFOS) program reached a milestone with the award of a contract for the fabrication and installation of most of its field systems. Designs for four national centers and the System Monitoring and Coordination Center were completed. Significant efforts began in the design of data acquisition functions and interfaces with the Air Weather Service and the Federal Aviation Administration.

Automated forecasting techniques improved forecasting during severe local convective weather in each of the key ranges (i.e., medium, short and very short). These advances include rederived forecast equations which rely heavily on manually digitized radar (MDR) data. Since the lower atmosphere strongly influences severe local storms, work continues on the refinement of a three-dimensional numerical forecast boundary layer model (BLM) to aid in severe storm prediction.

In weather prediction for the marine environment, work continued on the development of techniques for oceanic, coastal and Great Lakes forecasting. NWS submitted a first draft of a forecasting manual for oil spill trajectory forecasting for EPA. In addition, a modification occurred in the Special Program to List Amplitudes of Surges from Hurricanes (SPLASH) in order to accommodate curved coastlines and the effects of shallow offshore water on surge dynamics. An automated beach erosion forecast technique for the northeast and middle Atlantic coasts of the United States was also implemented. Storm surge forecast techniques for Lakeport and Essexville, Michigan, will also be implemented and transmitted as an addition to the Lake Erie storm surge message.

Also during the past year, NWS installed a 35-station solar radiation network. Currently, all stations can measure total radiation. ERDA and NOAA will combine funds to add to the capability for measuring direct and indirect radiation at several locations in 1977. For further information regarding NOAA, contact: Dr. Joseph F. Caponio, Director, Environmental Science Information Center, Environmental Data Service, National Oceanic and Atmospheric Administration, Department of Commerce, Washington, D.C. 20235, (202) 634-7399.

NATIONAL TECHNICAL INFORMATION SERVICE

Although the United States has no national scientific and technical information system, the National Technical Information Service (NTIS) offers the broadest range and the most in-depth coverage of products and services across the entire spectrum of science and technology. For nearly two decades, the NTIS has accomplished its mission to support and encourage the health and growth of commerce, industry, science and technology in the United States. NTIS has offered products and services which are designed to produce a means of transferring Government-funded technology and other practical information to the public and private sectors.

A community of over 130,000 NTIS users indicates in words and through repeat orders that NTIS products and services are valuable aids to decision-making and problem-solving.

NTIS has added new reports to the system at increasing annual rates, with growth progressing from 45,000 reports in 1971 to over 72,000 in 1976. These figures are twice the number of new books produced by all U.S. publishers. The total data base now includes over 1,000,000 items, 500,000 of which are in machine-readable form.

USER PRODUCTS AND SERVICES

Documents

NTIS fills orders for about 12,000 research reports daily. The reports are generally available in both paper copy and microfiche on a permanent basis.

Periodicals and Indexes

Weekly Government Abstracts, published in 26 categories of interest as weekly newsletters, contains summaries of research reports and other specialized information materials. *Government Reports Announcement and Index* is an all-inclusive biweekly journal published for users who require all subject categories in a single volume, with an accompanying index. The publication listed 60,000 reports in 1976.

Subscriptions to these products totalled 30,000 in 1976, compared with 25,000 a year earlier. There are potentially 12 million referrals to items in the NTIS data base each year through circulation of these periodicals and indexes.

Standing Order Microfiche Service

Selected Research in Microfiche (SRIM) automatically provides subscribers with microfiche copies at a reduced cost of the full texts of reports in subject areas they select. NTIS subject specialists help subscribers choose a strategy from among some 500 different subject categories and 200,000 unique descriptive terms.

Computer Search Service

For retrospective information retrieval, several large information processing systems supply the NTIS Bibliographic Data Base to a computer network serving 3,000 to 4,000 subscribers who make over 300 searches of the NTIS file daily. In addition, 30 additional information organizations which perform more than 7,000 SDI and awareness searches each day lease the NTIS data base. NTIS also provides on-line search services (NTISearch) of its own and of several closely related bibliographic files. In 1976, on-line searches of the NTIS file totalled over 150,000, while data base leasors performed an additional 2,500,000 searches. The NTIS facility also makes available published searches completed in response to previous demand in various subject areas with over 1,000 titles listed.

NTIS is the marketing coordinator for the publications, technical inquiries and special analyses of more than 30 Special Technology Groups and Information Analysis Centers (IAC's).

NEW SOURCES OF REPORTS

During 1976, NTIS' legislative charge to collect "from whatever sources, foreign or domestic, that may be available" stimulated the consummation of major agreements with the Department of Commerce's Federal Information Processing Standards Program at the National Bureau of Standards; the Department of Health, Education, and Welfare's Assistant Secretary for Planning and Evaluation; the National Cancer Institute; and the Federal Election Commission. In addition, under a contract with the General Services Administration, NTIS operates the Federal Software Exchange Center for computer programs produced or owned by Federal agencies.

PRODUCT DEVELOPMENT

Through an agreement negotiated with the Lawrence Berkeley Laboratory, University of California, NTIS now provides custom access to a very large data base of 1970 Census Data maintained by the Laboratory. The data base contains all of the employment-related information of the 1970 Census. NTIS plans to expand this service in 1977, as well as to provide access to similar data bases in the next few years.

In late 1976, NTIS developed a new product called *NTIS Tech Notes* which provides customers with an easily readable selection of the latest in Federal technological advances and inventions. Contributors to the series include such Federal agencies as NASA, Bureau of Mines, Forest Service, NIH, as well as the Departments of the Air Force, Army and Navy.

NEW SERVICES

In October 1976, NTIS initiated an experimental program to make Federal laboratory operational methodology more readily available to private industry. Through the efforts of the Federal Laboratories/Industry Information Referral Service, NTIS provides direct contact between people in small and medium sized firms needing technological assistance and Government specialists. Industry requirements are channeled to NTIS through Economic Development Administration supported University Extension Centers.

The NTIS seminar and workshop program gained momentum throughout 1976. This program sponsored more than 30 seminar/workshops with agendas designed to satisfy the special interests of the varied groups. Agendas included Environmental Information Seminars, Government-owned Patents Seminars, On-Line Computer Search Workshops, NTIS-AID Workshops and Technology Transfer Seminars cosponsored with the Commerce Department's Field Offices.

MARKET DEVELOPMENT

NTIS established the following three foreign managing dealerships in 1976: in the United Kingdom and in the Republic of Ireland, the managing dealer is Microinfo Limited; in France (and for Belgium and Switzerland), the Center for Business Information; in Japan, the Mitsubishi Research Institute, Inc. As a corollary to its foreign dealerships, NTIS is collaborating with government agencies in these countries for the interchange of various services, including the NTIS acquisition of selected research reports produced by these countries.

GOVERNMENT PATENT PROGRAM

NTIS promotional activities in 1976 included announcements in NTIS and other Government publications, the use of the private trade press, invention promotion seminars and licensing exhibits. A comprehensive U.S. Government Patent Portfolio Listing was developed in 1976 and will be published in early 1977. The Portfolio will list 16,000 Government Patents issued from 1966 through 1974. Additionally, the publication will be updated each year with 3,500 inventions from 12 different Federal agencies.

NEW ORDERING OPTIONS

Working toward improved document delivery service during 1976, NTIS offered three ordering options for its customers, which included Rush Handling (24 hour turnaround-time at NTIS), Premium Service (Free 800 telephone number plus Priority Mail Delivery) and Regular Service.

For further information on NTIS, contact: William T. Knox, Director, National Technical Information Service, U.S. Department of Commerce, Suite #620, 425 13th Street, N.W., Washington, D.C. 20004, (202) 724-3374.

OFFICE OF TELECOMMUNICATIONS

The mission of the Office of Telecommunications (OT) is to assist the Department of Commerce in fostering, serving and promoting America's economic development and technological advancement by improving man's comprehension of telecommunication science and assuring the effective use and growth of America's telecommunication resources. Results of OT's work are made available to the public through speeches, technical reports, special publications and brochures.

As administrator of a departmental Science and Technology Telecommunications Task Force, the Office prepared a final report entitled "Lowering Barriers to Telecommunications Growth". This report assessed the factors impeding the marketing of four promising technologies--direct communication satellites, land mobile radio, fiber optic communications and broadband communications networks.

In cooperation with the National Science Foundation, OT completed a study which provides the first precise quantitative analysis of our economy's information sector and of that sector's work force. By means of an input-output matrix, the study also affords an overview of the interactions among information-related institutions.

Another project measured the effect that a rise in telephone installation and disconnection charges had on the rate of requests for these services in Colorado over a one-year period. This represents one of the few studies designed to evaluate how telephone demand varies with changes in price.

In 1976, the Office submitted three filings to the Federal Communications Commission. These filings, which were all technical in nature, concerned the effect of radio signals on "clear channel" broadcast signals, the impact of sunspot activity on Citizen's Band communications and the problems posed by telephone inter-connection.

WORKING FOR AND WITH OTHER AGENCIES

During the course of 1976, OT contributed a good deal of support to the Federal spectrum management activity. Calling upon computer models and data bases, the Office analyzed 31 proposed Federal telecommunication systems to insure that they conformed to regulations and would be compatible with other systems. In addition, to help alleviate some of the spectrum compatibility and congestion problems, the Office devoted special attention to the following radio frequency bands: 7.25 to 8.4, 8.5 to 10.55 and 13.25 to 15.35 gigahertz*; and 960 to 1,300, 162 to 174, 406 to 420, and 2,700 to 2,900 megahertz. OT is also coordinating a spectrum management career training program, in cooperation with the White House Office of Telecommunications Policy. This program provides the Government with a pool of trained employees in the field.

For the U.S. Postal Service, OT evaluated technical proposals for a feasibility study of several electronic message service systems. Additionally, the Office developed a set of technical requirements for such a system. OT advised the U.S. Army Communications Command about the purchase of digital communications equipment for a pilot project involving five microwave radio links in West Germany. Since the purchase, OT staff engineers have evaluated the equipment's performance.

The Office completed an investigation into how certain types of buildings alter the strength of radio signals received within them. Performed for the National Aeronautics and Space Administration, the study is a contribution to a proposed disaster warning system featuring a design plan where signals are transmitted from satellites to antennas in homes.

As part of its support work for the Office of Telecommunications Policy, OT published market analyses of two important items of telecommunication equipment--private automatic branch exchanges and small satellite earth stations.

NEW AND CONTINUING PROGRAMS WITH INTERNATIONAL ORGANIZATIONS AND FOREIGN COUNTRIES

OT contributed extensively to the activities of the International Telecommunication Union (ITU), a United Nations Agency. Through its participation in an *ad hoc* committee of the Interdepartment Radio Advisory Committee, the Office took part in the U.S. preparations for the ITU's next three scheduled World Administrative Radio Conferences (WARC). Staff members participated in many of the special study groups of the ITU's two International Consultative Committees, one dedicated to radio, the other to telephone and telegraph.

Finally, the Office provided the project manager and a broadcast engineering specialist for the team of consultants which visited Saudi Arabia to survey the radio and television needs of that Nation's Ministry of Information. For further information, contact: Lois Adams, Public Information Officer, Office of Telecommunications, U.S. Department of Commerce, Washington, D.C. 20230, (202) 724-3361.

*1.0 gigahertz equals 1,000 megahertz.

U.S. PATENT AND TRADEMARK OFFICE

The chief activity of the U.S. Patent and Trademark Office is the examination of patent applications and the granting of patents for inventions which satisfy the statutory criteria. In addition, the Patent Office publishes and disseminates patent information, maintains search files of U.S. foreign patents, maintains a scientific library and a public search room, supplies copies of patents and related official documents to the public and periodically publishes technology assessment and forecast reports.

One of the important reasons for having a patent system is to inform the public of inventions which might not otherwise be disclosed. In the United States (as elsewhere), the volume of patent literature in existence continues to proliferate dramatically. Due to cross-referencing, the patent search files contain more than one copy of most patents and there are now approximately 12 million copies of U.S. patents, 9.5 million foreign patents, as well as other technical documents in the files. Approximately 250,000 U.S. patent documents are added to the files annually. A substantial amount of Patent Office activity is also devoted to making this patent literature available to the public.

CLASSIFICATION INFORMATION

The Patent and Trademark Office makes available several kinds and forms of information concerning the classification of patents. Through the use of keyboard-controlled viewer terminals located in the public search room and connected to a minicomputer, the user displays the class and subclass location of a patent after entering its number on the keyboard. Subsequently, by entering the class and subclass number, the viewer screen displays a listing of all patents in the subclass. Classification data files on 16mm microfilm are available through the National Technical Information Service (NTIS). Users can obtain listings of all original and cross-reference patents contained in a subclass from the Patent and Trademark Office at a cost of 1 per sheet of 100 numbers or less. In addition, copies of the U.S. classification manual and the classification index are available for purchase from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Users can also acquire copies of class definitions and reclassification orders which describe recent changes directly from the Patent and Trademark Office by addressing orders to the following:

Office of Planning Support and Control
Box 9
U.S. Patent and Trademark Office
Washington, D.C. 20231

OFFICIAL GAZETTE

One of the most effective means of dissemination of patent information to the public is the *Official Gazette*. The Gazette contains a summary, including a drawing and patent claim, of each of the approximately 1,600 patents granted weekly. The *Gazette* is arranged according to the patent classification scheme. When interested in the complete patent specification, an individual may order copies of the pertinent patent. The *Official Gazette* is available through subscription from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, as well as from more than 500 libraries throughout the United States.

COPIES OF PATENTS

The Patent and Trademark Office distributes 22,000 copies of patents daily on a worldwide basis. Five million copies of patents are sold annually, at 50 cents per copy. In addition, the Patent and Trademark Office provides copies to foreign patent offices participating in exchange agreements and to libraries at nominal cost. Subscriptions are available for copies of all patents issued in a specific subclass.

PUBLIC SEARCH ROOM

The Patent and Trademark Office maintains a public search room to enable the public to conduct investigations of the patent literature. Employees are available to explain patent search techniques. The search room contains paper copies of all U.S. patents, arranged according the the U.S. classification system. A second set of patents exists on 16mm microfilm cartridges and is arranged in numerical order. Coin-operating microfilm reader-printers are also available for public use in the search room.

The scientific library of the Patent and Trademark Office is also open to the public. The library contains several hundred thousand volumes of technical literature, as well as patents from 26 foreign countries.

In addition to the facilities at the Patent and Trademark Office, more than 20 public libraries in the United States have collections of patents which are supplied to the libraries at a minimal cost under a special statutory authorization.

TECHNOLOGY ASSESSMENT AND FORECAST

In its own unique way, the vast patent file represents a national resource. As part of its effort to maximize the use of this file for the greatest public benefit, the Patent and Trademark Office established its technology assessment and forecast program in 1971.

In its most general terms, the program stimulates and enhances the use and useability of the patent file, and assembles, analyzes and composes meaningful data about the file. To carry out this mission, the Office of Technology Assess-

ment and Forecast (OTAF), which administers the program, has assembled and built a master data base covering all U.S. patents. OTAF periodically updates this base and strives continually to add new data items to it (e.g., the recent addition to the base of patent ownership data and relationships beween the Patent Classification System and the Standard Industrial Classification system).

OTAF uses the data base in two principal ways. First, it periodically publishes general distribution reports (seven, to date). These publications have included reports on highly active technological areas, areas experiencing high levels of patenting by foreign residents, profiles of the patenting patterns of selected foreign countries and U.S. residents and comparisons of patent activity with research and development investment in selected industries. In addition, several of the publications have examined the patenting in high interest energy technologies.

The seven general-distribution OTAF reports already released by the Patent and Trademark Office are as follows:

- *Initial Publication*, May 1973: COM 73-10767 (4.40 - Domestic, 11.00 - Foreign)
- *Early Warning Report*, December 1973: COM 74-10150 (9.25 - Domestic, 18.50 - Foreign)
- *Third Report*, June 1974: COM 74-11383 (7.50 - Domestic, 15.00 - Foreign)
- *Fourth Report*, January 1975: COM 75-10050 (6.00 - Domestic, 12.00 - Foreign)
- *Fifth Report*, August 1975: COM 75-11142 (7.75 - Domestic, 13.50 - Foreign)
- *Sixth Report*, June 1976: COM PB 254188 (7.50 - Domestic, 13.50 - Foreign)
- *Seventh Report*, March 1977: COM PB 265792 (7.75 - Domestic, 15.50 - Foreign)*
- *Microfilm of Previous Reports*, (3.00 - Domestic, 4.50 - Foreign)

Users can order OTAF publications from the following:

National Technical Information Service
U.S. Department of Commerce
Springfield, Virginia 22151

The second principal use of the OTAF data base is made in the preparation of special reports which can be tailored to individual needs. Many Government agencies and a number of private sector corporations have availed themselves of these reports, which are supplied on a cost reimbursable basis. For more information concerning Patent Office activities, contact: William S. Lawson, Office of Technology Assessment and Forecast, U.S. Patent and Trademark Office, Washington, D.C. 20231, (202) 557-2524.

*The Seventh Report is also available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

DEPARTMENT OF DEFENSE
DEFENSE LOGISTICS AGENCY

The overall mission of the Defense Logistics Agency (DLA) includes program responsibility for two activities related to the Department of Defense (DOD) Scientific and Technical Information Program. These activities involve the administration and operation of the Defense Documentation Center (DDC) and the administrative management of nine contractor-operated Information Analysis Centers (IAC's). Althouth the programs have different orientations, they each have essentially the same objective, i.e., to reduce unwarranted duplication of effort and thereby increase the productivity of Defense scientists and engineers.

The first program focuses on the operation of the Defense Documentation Center, located at Cameron Station, Alexandria, Virginia. DDC is a computerized information storage and retrieval center for centralized storage, control and dissemination of information related to DOD research and development.

DDC makes available, from one central source, over 1.2 million technical reports which document completed research. Services include supplying copies of documents (a total of 636,500 in 1976), preparing bibliographies from the collection and announcing availability of the approximately 26,000 technical reports acquired each year. Through an information exchange program executed in 1976 with the Australian Department of Defense, Australian Ministry of Defense, DDC is now able to highlight Australian announcement bulletins in its biweekly DDC Technical Abstract Bulletin (TAB). This medium now provides information to registered DDC users regarding newly accessioned DOD classified and limited distribution technical reports and new technical reports prepared by the Australian Department of Defense.

DDC also maintains the DOD Research and Technology Work Unit Data Bank which describes and makes available information regarding ongoing work. The data base contains about 20,000 active and 80,000 completed or terminated research summaries describing both DOD in-house and contractor-sponsored research and development. During 1976, it was queried 11,919 times. In 1976, an agreement was finalized between the Office of the Director, Defense Research and Engineering, DOD, and the Office of Chief, Research and Development, Canadian National Defense Headquarters, for the exchange of unclassified and unlimited research and technology work unit data between the two countries. However, by mutual agreement, distribution of these summaries is limited to the Defense Department agencies in each of the respective countries.

Information on planned DOD research and development efforts is contained in the Research and Development Program Planning Data Bank maintained by DDC. The Military Services submit approximately 4,000 projects and tasks per year to the data bank.

Additionally, DDC maintains an Independent Research and Development Data Bank established to increase the DOD control of IR&D expenditures and to strengthen procedures for review and control of contractor programs. However, due to the proprietary nature of the data, distribution is restricted.

Although originally established to serve the DOD, DDC services have been extended to all Federal Government agencies, their contractors, subcontractors and grantees. Users of DDC products and services are registered for services based upon their scientific and technical fields of interest. DDC does not service the general public directly; however, working agreements with the National Technical Information Service and Department of Commerce as well as the Smithsonian Science Information Exchange provide an outlet for unclassified and unlimited distribution reports and for Research and Technology Work Units distribution.

The second program for which DLA is responsible involves administration of nine contractor-operated DOD Information Analysis Centers. The objective of these Centers is to provide timely, authoritative information in specified areas of technology to scientists and engineers to increase their productivity. To accomplish this objective, each of the IAC's collects, reviews and selects from the world's scientific and technical literature and then evaluates, synthesizes and disseminates this information in a format most helpful to its users. Furthermore, the Centers are available to respond to technical inquiries in their field of special competence. Other center products include handbooks and databooks, state-of-the-art reports, critical reviews and technology assessments, besides current awareness publications. In order to maintain these activities, the IAC's impose a cost-recovery charge for their products and services.

ESTABLISHMENT AND OPERATION OF THE DEFENSE RDT&E ON-LINE SYSTEM (DROLS)

As of December 31, 1976, 92 operational remote terminals located in DOD agencies and laboratories, NASA, AEC and contractor related facilities, could search DDC's data bases and view retrieved information in a matter of seconds. Through printers located at each remote site, scientists and engineers can obtain a computer printout of the information, thus reducing the delays experienced in mailing procedures. Although major users of DDC's products and services are encouraged to install their own Defense RDT&E On-Line System (DROLS) terminals, DDC has placed terminals in the Defense Contract Administration Region Services (DCASR) Los Angeles and the Air Force Geophysics Laboratory, Boston, as an experiment to reach those users who do not have terminals at their locations. These experi-

mental offices are manned by DDC personnel to provide customized bibliographic services. During 1976, users performed a total of 152,097 searches on DROLS terminals across the country.

AUTOMATIC SERVICES

DDC has currently instituted Automatic Document Distribution (ADD) and Current Awareness bibliography programs. A biweekly automatic distribution of microfiche and bibliographic citation is based on profiles which reflect each user's field of technical interest.

DDC/IAC INTERFACE

Two of the DLA IAC's, Metals and Ceramics Information Analysis Center (MCIC) and Nondestructive Testing Information Analysis Center (NTIAC), in conjunction with the Army Plastics Technical Evaluation Center (PLASTEC) data bases, are now interfaced with DDC. This interface package developed by DDC places these IAC data bases online together and provides them with a remote input capability for storing their data. Additionally, the package makes the DDC data banks available to the IAC's, resulting in improved efficiencies and capabilities.

USER NEEDS STUDIES

In 1976, a user needs study was completed for DDC. In general, the survey indicated that organizations polled were satisfied with DDC and that DDC is taking advantage of the latest technology. The study viewed current and future needs of DOD scientists and engineers and evaluated their potential impact. Recommended long-range technical objectives provided by the study will be used in future planning for DDC.

During 1976, two studies were completed to insure that the IAC's are responsive to the scientific and technical information needs of the Defense community. The first study was a survey designed to determine the level of satisfaction with the IAC's. Principal findings indicated that the majority of users are satisfied with the Centers. The second effort focused on a comprehensive survey to identify scientific and technical information requirements of users and/or potential users of DLA administered IAC's. The results of this survey have proven useful in planning objectives.

Additionally during 1976, the DLA, as a result of RDT&E direction, initiated efforts to establish a new IAC specializing in information relative to tactical weapons guidance.

For more information on DLA science information activities, contact: Samuel I. Hetrick, Chief, Technical Information Branch, Cataloging and Technical Information Division, Cameron Station, Alexandria, Virginia 22314, (703) 274-6793.

DEPARTMENT OF THE AIR FORCE

The U.S. Air Force (USAF) Scientific and Technical Information (STI) program is an integral part of the research, development, test and evaluation (RDT&E) function of the Department of Defense. Primary responsibility for the USAF STI program rests in the Science and Technology Division, Directorate of Development and Acquisition, Headquarters United States Air Force (HQ USAF). The major objective of the USAF Program is to ensure that the scientific and technical information generated by RDT&E programs provides the maximum contribution toward the advancements in technical areas of interest to USAF and DOD, and that it contributes to the national research and development effort.

AIR FORCE-INDUSTRY INTERFACE

The USAF utilizes several means to increase industry awareness of its research and development plans and programs. To acquaint the industrial community with USAF information and its availability, a pamphlet of USAF advanced planning information was published and distributed with the assistance of major industrial associations, the Small Business Administration (SBA) and the other military services and agencies. Additional copies are available from HQ AFSC/DLXL, Andrews Air Force Base (AFB), Washington, D.C. 20334.

The major change in the USAF Information for Industry program in 1976 was the establishment of three Air Force Information for Industry Offices. These offices review such publications as the AFSC Planning Activity Report (PAR), the AFSC Research Planning Guide, Technical Objective Document (TOD), Technology Needs (TN's), plus selected Program Management Directives (PMD's) and Required Operational Capabilities (ROC's). The locations of these three offices are Headquarters Air Force Systems Command/DLXL, Andrews AFB, D.C. 20334; AFAL/TSR, Wright-Patterson AFB, Ohio 45433; and Air Force Information for Industry Office, 1030 East Green Street, Pasadena, California 91006.

AIR FORCE UTILIZATION OF GIDEP

During 1975, the USAF accomplished a revision of MIL-STD 1556A (USAF, June 14, 1974), a document which provides the means for contractually requiring participation in the Government Industry Data Exchange Program (GIDEP). The further revision, MIL-STD 1556A (USAF, February 29, 1976), will be printed and distributed in the spring of 1976. Additionally, the USAF has planned the triservice coordination with regards to this project for late 1976. The USAF Defective Parts and Components Control Program (DPCCP), a closed-lip system for recognition, elimination and future avoidance of defective parts, now utilizes GIDEP's ALERT system as its data dissemination and retention medium. (GIDEP is funded by the U.S. Government and managed by the Naval Material Command. For additional information about GIDEP, see Department of the Navy.)

ABSTRACTS OF NEW TECHNOLOGY

Since 1971, USAF and SBA have cooperatively administered a Technology Application and Utilization program to assist small businesses by improving their access to USAF developed technology. Under this program, USAF obtained Abstracts of New Technology (ANT's) from contractors and disseminated them through SBA to potential users throughout the small business community. During 1976, this program was expanded by an agreement where NTIS published ANT's as part of the *NTIS Tech Notes*.

PATENT APPLICATIONS AND PATENTS

Information regarding inventions for which USAF retained (or obtained) title is provided to DDC and subsequently to NTIS. This information includes patent applications as well as the issued patents for those applications which were either classified or submitted prior to initiation of this procedure. NTIS announces this information in the *Official Gazette* of the U.S. Patent and Trademark Office (Department of Commerce), in the *Federal Register*, and in its own publication, *Government Inventions* for Licensing. For more information, contact: Capt. James McDonald, Scientific and Technical Liaison Division, U.S. Air Force Systems Command (DLXL), Andrews AFB, Washington, D.C. 20334, (301) 981-3371.

DEPARTMENT OF THE ARMY

The mission of the Army Scientific and Technical Information (STINFO) Program is to provide for technology transfer by aiding Army scientists, engineers, technicians and managers to gain optimum access to the world's technical information and by disseminating information generated by the Army. The objective of the program is to initiate and foster RDT&E in the prompt and systematic transfer of scientific and technical information (including natural, social, health and legal sciences) using communications, information, library and computer sciences.

To fulfill this program objective STINFO is responsible for supporting and coordinating efforts in the acquisition, analysis, processing, documentation, recording, storage, retrieval and dissemination of all information related to RDT&E.

The Army STINFO program management is accomplished through the following activities:

- Direct and Indirect Liaison.
- Coordination
- Committee membership or participation
- Proponency and implementation of regulations
- Monitoring (outside of Army) STINFO activities
- Technical Information Activities Program Management (line item in the Army budget).

A line item in the Army RDT&E Budget titled Program Element 6.58.03, Technical Information Activities, provides financial support to specific RDT&E projects in the STINFO program. Projects currently supported under this element include the following:

- Modernized Army Research and Development Information System (Mardis) Support
- Integrated Software
- Automated Engineering Document Preparation System
- Technical Information Functional Activities
- Information Technology
- Symposia-Conferences
- Technical Information Analysis Centers
- SIGINT/EW Technical Information.

MARDIS SUPPORT

A new project was added to the Army STINFO program in 1976, namely, the Modernized Army Research and Development Information System (Mardis) Support which provides for development, operation and maintenance of the program. The objective of this project is to improve the availability of research and development management information through source data automation.

ARMY'S INTEGRATED SOFTWARE RESEARCH AND DEVELOPMENT PROGRAM

The Integrated Software project funds the guidance of the developmental efforts required to manage the Army's Integrated Software Research and Development (ISRAD) program. This responsibility includes such activities as the development and coordination of program objectives, the identification of currently active software, the preparation of abstracts and analyses of this software, as well as the identification of software needs.

AUTOMATED ENGINEERING DOCUMENT PREPARATION SYSTEM

The Automated Engineering Document Preparation System (ADEPS) serves as the instrument by which the automation of information used repeatedly in preparation of engineering drawings and in dialog for procurement of technical components is accomplished. The methodologies utilized in the preparation of documentation for weapon system procurement employ computer techniques. This preparation involves the development of computer accessible generic names for nonstandard equipment parts. The goal of ADEPS is a data base containing 139 generic names. In 1976, ADEPS completed approximately 21 of these generic names bringing the overall total to 102.

TECHNICAL INFORMATION FUNCTIONAL ACTIVITIES

The Technical Information Functional Activities Project provides automated management with inputs from the Army technical arena vis universal Defense Document forms 1498 and 1634 to the existing information system. Efforts to permit direct computer input of the forms 1498 and 1634 are continuing. This capability will enable laboratories to provide the Defense Documentation Center (DDC) with direct input of these forms from the DDC terminals located at the laboratories.

The Mardis system listed above was developed over the past three years. Plans call for completion of this sytem in FY 77 when all Mardis efforts will then be moved to a separate project called Mardis Support.

INFORMATION TECHNOLOGIES

The Information Technologies project supports research in information science and development of improvements in technical information exchange (e.g., glossaries, thesauri, storage and retrieval and display techniques). Efforts sponsored by this project in 1976 included research in technical information transfer using data compression, automated selection of materials, hazard failure data bank development, production of an automated data base and a glossary for soil mechanics as well as a cement bibliography. This project also sponsors funding for the Army participation in the Government Industry Data Exchange Program (GIDEP). (For a complete description of GIDEP see the Department of the Navy section).

SYMPOSIA/CONFERENCES

The Symposia/Conferences project fosters youth science activity in high schools throughout the United States. Project functions include an annual program involving science experiments and displays together with a program involving science research papers. Additionally, this project sponsors a biannual Army Science Conference for Army scientists. A new objective added to this project in 1976 was the promotion of technical conferences and symposia in specific fields of interest to the Army through direct support to the activity holding the conference.

TECHNICAL INFORMATION ANALYSIS CENTERS

The Technical Information Analysis Centers (TIAC) project provides for partial support to seven specialized information resources located in high technology Army laboratories. These centers collect and disseminate state-of-the-art bibliographic materials and review technology in specialty fields. Patrons consist primarily of Army laboratory personnel; however, TIAC's also serve the general public. In 1976, applications for establishing four new Army centers were received and were supported for trial operation. The project is currently assembling conceptual designs for two additional centers without funding support.

SIGINT/EW TECHNICAL INFORMATION

A project entitled Signals Intelligence/Electronic Warfare (SIGINT/EW) Technical Information provides for the development of specialized data bases and information resources of unique interest to the Army intelligence community. The objective is to improve the accuracy, availability and accessibility of signals intelligence and electronic warfare information. In 1976, the project contracted a study to enable project engineers to access the work of others through the use of technical interest profiles. For further information, contact: E. J. Kolb, Principal Army Technical Information Officer, Headquarters, U. S. Army Material Development and Readiness Command, Alexandria, Virginia 22333, (202) 274-9830.

DEPARTMENT OF THE NAVY

The Navy Technical Information Program supports the management of the Navy RDT&E Program by the acquisition and dissemination of scientific, technical and management information. Its function is to improve and facilitate information flow not only within the Navy but also between the Navy and small business, industry, State and Local governments, the academic community, other DOD activities and other Government agencies.

NAVY INTERFACE WITH INDUSTRY

Navy Research and Development Information Centers

The Navy Research and Development Information Centers (NARDIC) are focal points within the Navy for making information on planning and requirements available to small business, industry, universities and non-profit institutions. NARDIC offices provided Navy information to approximately 850 industry and small business representatives in 1976.

NARDIC services are available to organizations registered for access to DOD information services based on a current DOD contract, or those which have a demonstrable capability of engaging in research and development and are participating in either the Navy/Industry Cooperative Research and Development (NICRAD) program, or the potential contractor programs of the Army or Air Force. During 1976, documents available in the NARDIC offices included *Program Element Descriptive Summaries, Laboratory Program Summaries, Research and Technology Objectives, Specific Operational Requirements, Advanced Development Objectives, Research and Development Planning Summaries* and *Proceedings of Advanced Planning Briefings for Industry.* Additionally, NARDIC offices now augment their services with on-line computer terminals which access the DDC RDT&E data banks.

NICRAD Program Instruction Issued

Issued in August 1976, Instruction NAVMATINST 3900.14 increased emphasis on the NICRAD program. This instruction defines the program, together with facilitating and encouraging potential contractor participation in the program on a cooperative, no cost agreement basis. The Navy negotiated 73 policy agreements with potential contractors in 1976.

NARDIC and Industry/Small Business Conferences

NARDIC representatives participated with representatives of 13 other Government agencies in the National Science Foundations--Research Applied to National Needs Small Business Conference. The Conference was held on January 21 and 22, 1976, in Washington, D. C.

At the request of Congressional sponsors, NARDIC representatives attended six Business Opportunity/Federal Procurement Conferences in California and Ohio, and a Small Business Symposium in the Washington, D. C. area, where they served as counselors on the Navy's research and development work potentially available to industry.

NARDIC personnel also participated in four laboratory technical briefings for industry, as well as in two conferences held by national industry associations.

Advanced Planning Briefings for Industry

Advanced Planning Briefings for Industry (APBI) are formal, classified presentations on Navy research and development plans, programs and problems. The Naval Air Systems Command initiated arrangements for a February 1977 APBI on Naval Firepower to be hosted in cooperation with the Naval Sea Systems Command.

Industry Independent Research and Development

Companies in the Industry Independent Research and Development (IR&D) program held two Washington, D. C. area briefings in 1976. The Navy has extended this series of briefings to 14 since 1972. These briefings bring highlights of current IR&D developments directly to RDT&E managers of the Navy and other Government agencies. Other sources of IR&D information for RDT&E managers are the annual company IR&D technical plans, onsite reviews of private contractor IR&D programs and the IR&D data bank operated by the DDC.

In addition, NARDIC offices and APBI's supply information on Navy research and development problems and requirements to guide industry IR&D into areas benefitting the Navy.

TECHNOLOGY TRANSFER AND COOPERATIVE DEVELOPMENT

Technology Transfer Meetings, Workshops and Services

World Fair for Technology Utilization By Industry

The Navy displayed a marine technology exhibit at the World Fair for Technology Utilization by Industry in Chicago, Illinois, from February 2 to 6, 1976. The purpose of the Fair was to publicize patent licenses available to industry. Attendance was estimated at approximately 2,000 people from over 30 countries.

California Laboratory Consortium Technology Transfer Seminar/Workshops

In April 1976, California Laboratory Consortium participants from three Navy research and development centers conducted a series of technology transfer seminar/workshops in Hawaii in cooperation with the Energy Research and Development Administration (ERDA). The workshops focused on topics ranging from the development of programs for technology transfer to details of specific projects such as the transfer of Navy-developed public works capabilities to State and local governments.

Society of American Military Engineers Technology Transfer Seminar/Workshop

The Navy participated in a regional seminar/workshop held by the Society of American Military Engineers in Panama City, Florida, during November 3-5, 1976. The theme for the seminar/workshop was "T - Military Engineering's Contribution to the Quality of Life". The meeting successfully provided a forum for increasing State and local government awareness of the Navy research and development technology transfer resources available to them in their regional areas.

Federal Laboratory Consortium Meeting

A Federal Laboratory Consortium Meeting on Technology Transfer was held in Berkeley, California, November 9-11, 1976. The agenda consisted of discussions on the World Fair for Technology Utilization by Industry as well as presentations on the technology transfer capabilities of new members of the Consortium. Panel discussion topics included definition of the Federal Laboratory and industry technology transfer, a National Science Foundation update on State and local government programs, technology transfer between the Federal laboratories and State and local governments, and an overview and highlights of the Federal Laboratory Consortium energy research and development efforts.

Technology Transfer Publications

Navy Technology Transfer FACT SHEET

Since its first issue in December 1975, the *Navy Technology Transfer FACT SHEET* provides a monthly forum for selected current Navy technology items with high potential for civilian application. The *FACT SHEET* is distributed to more than 1,600 U. S. companies, as well as to Federal Government agencies, State and local governments and others with a particular interest in technology transfer. Nearly 5,000 readers requested and received further information on items described in the *FACT SHEET* during 1976.

Executive Summary of the Third Annual Report

The Navy's technology transfer and cooperative development program published the *Executive Summary of the Third Annual Report* in 1976. This report briefly summarizes the combined objectives and results of the over 190 Navy technology transfer and cooperative development projects conducted during FY 75.

Directory of Navy Scientific Investigators

A new edition of the *Directory of Navy Scientific Investigators* was issued in November 1976.

DEFENSE RDT&E ON-LINE TERMINALS

A total of 19 terminals for the DDC RDT&E On-Line System are in use at Navy RDT&E facilities, including the Headquarters Naval Material Command, the Naval Academy, the Naval Postgraduate School, the NARDIC offices, and the Office of Naval Research. The Naval Surface Weapons Center, Dahlgren Laboratory, Dahlgren, Virginia, made plans to install a twentieth terminal in May 1977. All of the terminals access the DDC information network (DD-1634, DD-1498) and Technical Report (DD-1473) data banks. Sixteen of the activities have access to the Industry/IR&D data bank (DDC-271). Four Navy sites in the Washington, D.C. area will also install an experimental secure dial-up terminal in Spring 1977.

Navy Use of Terminals

An indication of the usefulness of the on-line terminals to Navy RDT&E management and technical personnel is the report from DDC that 41,318 searches (involving one or more questions) were made from terminals at Navy activities during 1976. This report reflects an increase of more than 15 percent over the number of searches documented for 1975.

PUBLIC RELEASE OF INFORMATION

Naval Material Command components released more than 3,000 items (including news releases, speeches, technical papers and films) to the public during 1976.

THE SHOCK AND VIBRATION INFORMATION CENTER

The Shock and Vibration Information Center (SVIC), located at the Naval Research Laboratory, Washington, D.C., is the only Navy-managed DOD Information Analysis Center (IAC). SVIC derives more than 70 percent of its financial support from subscribers to its services. These subscribers include 61 industry and academic organizations and 24 major Federal Government agencies.

During 1976, SVIC completed its eighth year of publication of the *Shock and Vibration Digest*, a monthly current awareness journal. The SVIC comprehensive state-of-the-art monograph program continues to move ahead. *Calibrations of Shock and Vibration Transducers*, the eleventh monograph in the series, is in final editing and will be published in mid-1977.

Also in 1976, SVIC held the 47th Shock and Vibration Symposium in Albuquerque, New Mexico with the Defense Nuclear Agency as host. Approximately 350 industry and Government representatives attended to hear presentations of 90 technical papers and 3 panel discussions. The Symposium papers will be published by SVIC in its 47th *Shock and Vibration Bulletin*.

In addition to its other activities, SVIC maintains an information service to answer inquiries on shock and vibration problems. This service offers direct, expert technical responses to user questions and access to a computerized bibliographic data base for literature searches. New entries to the data base are being made at the rate of 3,000 per year.

GOVERNMENT/INDUSTRY DATA EXCHANGE PROGRAM

The Government/Industry Data Exchange Program (GIDEP) is a cooperative activity between Government and industry participants who seek to reduce or eliminate expenditures of time and money by making maximum use of existing knowledge. GIDEP provides a means to automatically

exchange certain types of technical data essential in the research, development, production and operational phases of the life cycle of systems and equipment.

The U.S. Government handles the entire funding of GIDEP, its program manager is located at Headquarters Naval Material Command. Participation in GIDEP is now mandatory in DOD and NASA organizations. The GIDEP Operations Center is located at the Fleet Analysis Center (Code 805), Corona, California 91720.

Participants in GIDEP are provided access to the following four major data banks:

- Engineering Data Bank
- Failure Experience Data Bank
- Failure Rate Data Bank
- Metrology Data Bank

Three special services are available to GIDEP participants. The first service is the ALERT System, which notifies participants of problem areas. The second is the Urgent Data Request System, through which a participant may query all other GIDEP participants on specific problems. The third is the Metrology Information Service (MIS), which provides participants with rapid response to queries related to test equipment and measurement services. The MIS system also includes an extensive research capability available to participants on a fee basis. With the exception of special MIS search requests, all GIDEP services are available without charge to participants. For further information, contact: P. B. Newton, Jr., Director, Navy Technical Information, Headquarters Naval Material Command, Washington, D.C. 20360, (202) 692-0515.

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

ALCOHOL, DRUG ABUSE, AND MENTAL HEALTH ADMINISTRATION

The Alcohol, Drug Abuse, and Mental Health Administration (ADAMHA), formed in 1973, deals with the sociomedical problems of alcohol abuse, drug abuse and mental illness. The major subsidiary components of ADAMHA are the National Institute on Alcohol Abuse and Alcoholism (NIAAA), the National Institute on Drug Abuse (NIDA) and the National Institute of Mental Health (NIMH). All three institutes carry out research and development programs in coordination with training and services programs.

NATIONAL CLEARINGHOUSE FOR ALCOHOL INFORMATION

The National Clearinghouse for Alcohol Information (NCALI) is an information service of NIAAA established to search out worldwide information on alcoholism prevention, treatment and research, and to share this knowledge with the professional community and the general public.

During 1976, a 3,423,000 cost-plus-award-fee contract with the General Electric Company funded NCALI's fourth full year of operation.

The Clearinghouse shares its alcohol information through a variety of services and products designed to assist its many different users. Through a system of acquiring and processing information about alcohol, thousands of persons can receive information they need in a form that is most helpful to them. During 1976, the Clearinghouse continued its efforts to provide such products and services as the following:

- Responding to individual requests from a wide variety of audiences--researchers, alcoholism counselors, program administrators, teachers, students and friends and relatives of alcoholic people. (Responses range from NIAAA-prepared pamphlets and posters to bibliographies and computer searches.)
- Publishing an "Information and Feature Service" and a quarterly magazine offering news of developments and state-of-the-art reports
- Assembling annotated bibliographies on various aspects of alcohol and alcoholism
- Disseminating special Current Awareness Services to assist professionals in keeping abreast of the latest literature in selected topic areas
- Assisting NIAAA's prevention program through an Information Dissemination Program designed to enlist the aid of such organizations as universities, women's groups and national youth serving agencies in the campaign against alcoholism.

Acquisition and Processing of Literature

As an information center, the Clearinghouse collects literature on all aspects of alcohol and alcoholism from all possible sources around the world. NCALI's information system centers around a reference library and a data repository which contain more than 51,000 items, including books, audiovisuals, journals, magazines, lay literature, microfilm and abstracts of documents. During 1976, the library added some 4,800 items to the collection, ranging over such fields as research, education, grant information and legislation. Both NIAAA and international researchers alike use the reference library.

After these bibliographic materials are gathered, NCALI personnel analyze, process, format and enter them into a computerized data base. These files contain approximately 25,000 documents, grant and records.

During 1976, the Reference Service completed an update of the national directory of alcoholism treatment facilities, and prepared an expanded, updated version of the guide to audiovisual materials. In addition, the reference service prepared an insurance resource kit and a series of fact sheets on insurance, youth, women and the minimum drinking age, together with other topics of current interest.

Current Awareness Services Materials

The Current Awareness Service is responsible for providing greater knowledge and insight into the alcoholism problem to key groups in such fields as medicine, law enforcement, social work and industry. The purposes of the Current Awareness Service are to search out new users of Clearinghouse services and to keep registered users up to date on new developments.

To help workers in the alcoholism field keep abreast of recent developments, the Clearinghouse prepares two publications. The *Information and Feature Service* provides brief reports on treatment and prevention, new publications, meetings, grants and other information. During 1976, mailings reached 600,000 registered users. A quarterly magazine, *Alcohol Health and Research World*, provides in-depth information on such topics as prevention, research and treatment

innovations. NCALI sent out a total of 150,000 magazines in 1976. Also during this year, *World* received clearance from the Office of Management and Budget as a regular Federal periodical and went on a paid subscription basis. When the first paid issue was published in the fall of 1976, almost 4,000 people had subscribed.

Current Awareness Service provides two additional channels to keep its users informed. *Grouped Interest Guides*, issued semiannually, are bibliographic updates of new documents in 15 categories. During 1976, the Service mailed the *Guides* to an average of 6,400 persons on a scheduled basis (29,000 *Guides* per mailing--each receiving several guides guides depending upon the specific field of interest). Issued monthly, *Individualized Interest Cards* allow subscribers to be more selective in choosing topics of interest from over 100 categories. In 1976, the Service mailed *Individualized Interest Cards* to an average of 6,500 persons each month. Through its varied services and products, the Current Awareness Service contacted more than 500,000 potential users during 1976.

Information Dissemination Program

A unique feature of the Clearinghouse is the Information Dissemination Program (IDP) which is designed to assist the Institute's prevention program through enlistment of previously uncommitted resources in the campaign against alcoholism. Focusing on such groups as universities, women's organizations and youth serving agencies, IDP activities are aimed at motivating and helping these audiences to apply their own resources to establish prevention programs. Clearinghouse field representatives around the country further aid the outreach activities of IDP. These representatives develop and implement NIAAA/NCALI projects which have broad applications and can be replicated in other states.

The following are highlights of various projects undertaken in 1976 as part of the Information Dissemination Program:

University 50 + 12. Launched in 1975 when NCALI staff visited 63 major universities, this project stimulated the establishment of alcohol abuse prevention projects on campuses and gathered information about existing education programs. The best of these program ideas was published in 1976 in a manual entitled "The Whole College Catalog About Drinking: A Guide to Alcohol Abuse Prevention." In addition, a University 50 + 12 Seminar, held in Notre Dame, Indiana, brought together university liaisons involved in the project and State Prevention Coordinators, among others, to focus on ideas and strategies for implementing prevention programs on campus. NCALI is now disseminating the manual to additional universities across the country.

Women and Alcohol. During 1976, the Clearinghouse expanded the efforts it began in FY 75 to focus special attention on the problem of women and alcohol abuse. A program plan outlined a strategy for disseminating alcohol information and program ideas to women's advocacy groups, women's health organizations, State task forces on women and alcohol and women's professional associations.

In addition, NCALI developed two new publications to form the basis of special information kits designed for women's groups. *Alcohol Abuse and Women: A Guide to Getting Help* is aimed at the woman who thinks she may have an alcohol problem. *Alcohol Programs for Women: Issues, Strategies and Resources* encourages local and national organizations to develop alcohol programs for women, interests funding sources in supporting programs focusing on women and alcohol and aids nonprofit organizations in preparing proposals for such funding.

Foundations. As a result of research conducted in FY 75 to identify foundations as a possible source of funding for alcohol programs, NCALI prepared three new documents. The *Foundation Guide for Alcohol Program Planning* provides information on how and where to seek support for alcohol programs. The *Community Information Guide* presents an outline for identifying pertinent data about a community and acts as a standard in proposal preparation. The *Guide to Alcohol Programs for Youth* provides information and direction to youth serving organizations that wish to add alcohol projects to their ongoing efforts.

Film/Broadcast Industry. During 1976, the Clearinghouse developed plans and strategies for stimulating broadcast and film industry leaders to initiate changes in the way alcohol is portrayed in the media. NIAAA approved the plan and, subsequently, an Ad Hoc Committee on Alcohol and the Media was formed to bring together film broadcast organizations such as the National Association of Broadcaster's Code Authority, the Writers Guild and the American Federation of Television and Radio Artists, among others.

Minority Publications. During 1976, NCALI initiated a project to develop information materials for various segments of the black population. This project sponsored a two-day Black Publications Workshop which was held to evaluate existing NIAAA alcohol publications for use with black target audiences; to develop themes, messages and formats of targeted materials; and to recommend methods of field testing and dissemination. A brochure and a poster series resulted from the recommendations of the workshop participants.

The Clearinghouse operation encompasses several other programs and support services, including the following:

Clearinghouse for the Department of Transportation's National Highway Traffic Safety Administration. This project involves warehousing of National Highway Traffic Safety Administration (NHTSA) standard pamphlets, responding to NHTSA inquiries from the general public and answering technical inquiries involving searches and correspondence.

Interagency Agreements. The Clearinghouse supports NIAAA's interagency agreement with the U.S. Navy's Alcoholism Prevention Program through the preparation and dissemination of special information material.

Quality Assurance. The Clearinghouse maintains a program of quality assurance to assess the overall operation, performance and adequacy of services.

Information Development and Dissemination. The Clearinghouse provides support to NIAAA's Occupational Programs Branch in the development and dissemination of information materials to business, industry and labor.

Transitional Quarter

During the transitional quarter, the Clearinghouse continued the basic operations of its information system. Among these are the following:

- Identifying, screening and acquiring literature from worldwide sources
- Maintaining a library
- Abstracting journal articles and other documents and maintaining a computer data base
- Providing responses to both technical and lay requests

- Developing reference materials
- Preparing two periodical publications and two selective notification services
- Providing warehouse, inventory, graphics and other support services.

During this period, reorganization of the Information Dissemination Program resulted in program emphasis on the four following target groups: women, youth, blacks and the elderly. Work began on a " grant replication" project designed to transfer to other appropriate communities the information and experience gained by NIAAA prevention grantees in the youth education area. Outreach activities focusing on product development and dissemination continued with a variety of such national organizations as Women's National Health Network, National Association of Broadcasters, Opportunities Industrialization Centers, Parents Without Partners and the American Legion Youth Division. For further information, contact: Ms. Theresa Bellicha, Chief, National Clearinghouse for Alcohol Information, Room 14C-20, Rockville, Maryland 20852, (301) 948-4450.

NATIONAL CLEARINGHOUSE FOR DRUG ABUSE INFORMATION

The National Clearinghouse for Drug Abuse Information (NCDAI) functions as the focal point within the Federal Government for the collection and dissemination of drug abuse information and the interchange of this information among Federal, State and local governments. In this capacity, the Clearinghouse collects, classifies, stores and disseminates scientific and general information on drug abuse; develops information resource materials such as bibliographies, fact sheets and directories; and responds to inquiries received by mail or phone from the Federal, scientific and professional communities, Congress, young people and the public in general.

Most requests are answered by distributing a general packet of information on drugs and their effects. The keystone of the general information packet is "Questions and Answers About Drug Abuse", the basic fact book of the Clearinghouse since 1970. The 1976 edition is complete with revised questions, updated answers, an I.Q. test, guidelines for community action and a condensed section on drug abuse prevention. The Clearinghouse operates a Resource Center which provides library and bibliographic services to the staff of the National Institute for Drug Abuse (NIDA) and to the public through interlibrary loan. The public is also free to use any of the materials and facilities in the Center. NCDAI operates a nationwide Drug Abuse Communications Network (DRACON) which supports satellite information centers affiliated with Federal, State and local government agencies, universities and training centers. The membership of DRACON meets annually to exchange information and ideas on information center operations. The Clearinghouse also maintains an on-line directory under the name Clearinghouse Program File (CPF) that provides information on drug abuse treatment programs concerning their staffing patterns, client population and services provided.

NCDAI provides single copies, free of charge, of its publications on request. Additional copies may be purchased from the Superintendent of Documents, Government Printing Office. For more information about DRACON, contact: Mrs. Leona D. Ferguson, National Clearinghouse for Drug Abuse Information, Room 10A 56, 5600 Fisher's Lane, Rockville, Maryland 20852, (301) 443-6500.

All general drug abuse inquiries and publication requests should be addressed to: National Clearinghouse for Drug Abuse Information, P.O. Box 1635, Rockville, Maryland 20850.

NATIONAL CLEARINGHOUSE FOR MENTAL HEALTH INFORMATION

During 1976, the National Clearinghouse for Mental Health Information (NCMHI) scanned approximately 1,200 journals, both national and international, for entries to include in its computerized information retrieval system. Clearinghouse information specialists prepared 16,000 searches from this system for mental health professionals and researchers throughout the world. Its Public Inquiries Section responded to 80,000 requests for information with letters, referrals and publications, 450,000 in all.

The Clearinghouse continues to provide specialized information retrieval services for professionals at the National Institute of Mental Health, furnishing material for research, speeches and professional papers and publications prepared within the various Divisions. Special bibliographic searches have been compiled for specific exhibits and programs such as the National Center for the Prevention and Control of Rape. NCMHI compiles and publishes seven bibliographies and directories each year.

Cooperative agreements have continued with a number of professional organizations. The Clearinghouse has reference work and inter-library loan arrangements with the American Psychiatric Association; provides psychoanalytic Association; and explores better methods for the coordination of abstracting efforts with the American Psychological Association. Collaboration with the National Library of Medicine continues. For more information, contact: Ms. Carrie Lee Rothgeb, Chief, National Clearinghouse for Mental Health Information, 5600 Fishers Lane, Rockwall 505, Rockville, Maryland 20857, (301) 443-4517.

HEALTH RESOURCES ADMINISTRATION
Bureau of Health Planning and Resources Development
Division of Planning Methods and Technology

NATIONAL HEALTH PLANNING INFORMATION CENTER

The National Health Planning Information Center (NHPIC) is a national resource mandated under the Health Planning and Resources Development Act of 1974 (P.L. 93-641). The law states that the National Health Planning Information Center shall provide a broad range of information on methods and approaches to support health planning and that the information be readily retrievable through the development of a computerized information file.

The content of the Center collection includes methods and approaches to support health planning with an emphasis on the "how to do" or solutions to problems in the health planning process. It does not include data unless the data is supported by detailed methodology. The information in the collection includes a combination of the formal literature as reflected in journals and books and a collection of fugitive documents heretofore not available to the health planner through any organized means. The latter group of documents includes Federal reports on health planning methods and approaches and State and local planning agencies' reports on similar activities. The collection of health planning information is available through a computer retrievable file with paper copy of all non-copyrighted citations available through the National Technical Information Service.

The Center's overall scope is concerned with the programs to support the intent of the Act as described above; however, there are two specialty components within the Center. First, there is a focus to support the development of nursing manpower planning through improved knowledge and dissemination of information on nursing manpower distribution and utilization; and second, information is disseminated on long term care with emphasis on training aids for long term care facility personnel and new approaches in providing long term care.

The Center is operated through a three-prong approach. The Federal staff within the Center has the responsibility for the coordination of all activities for the Center and for providing selective functions such as quality control, development of operational guidelines, technical reviews and dissemination to specific audiences of high interest materials.

Second, an outside contractor has the responsibility for document acquisition, subject and physical screening, abstracting and indexing, keyboarding, reference services and maintaining the Management Information File and Mailing List File. Third, there is an Inter-agency Agreement with NTIS for archival services copy satisfaction, announcement of all Center documents, printing, user training and all Center-related computer time services.

The Center audience is designated and coded in three groups. First, there is the primary audience consisting of the Health Systems Agencies, the State Health Planning and Development Agencies and the Centers for Health Planning which are specified under the health planning legislation. Included here, too, are the schools of public health and individuals and groups that train health planners, develop new and improved planning methods and provide technical assistance. This group also consists of Federal staff involved in health related activities in all Federal agencies, particularly the DHEW agencies which have responsibilities related to health planning activities, ie., SSA and SRS. A copy of the Weekly Government Abstracts, "Health Planning", is routinely disseminated to all members of Congress who occupy positions on health related committees.

The secondary audience includes a wide range of agencies and professional groups at the national and state levels which, while not directly involved in health planning, require health planning information to support their overall activities. Examples of these may be the State Boards of Higher Education, medical specialty groups and other trade organizations such as the AHA. This group receives documents of general use, such as the first publication in the Center's monograph series entitled "Trends Affecting the Health Care of the United States".

The third group consists of individuals with an interest in health care but no special affiliation or association with a planning agency or other health related groups. Such a requestor receives only the Newsletter which is sent to all who request it.

The Center's function and services are best explained by a review of its operational characteristics. Out of 16,604 documents screened for subject relevance, 12,059 were judged as within the Center's scope, including substantive studies and reports, core reference materials and vertical file records. The Center abstracted and indexed 9,592 documents during the year, and 8,142 documents are now part of a computer data base.

The WGA "Health Planning" has announced 6,877 document surrogates during the year. Weekly dissemination of "Health Planning" totals 1,140 copies, including mailings to health planning centers, schools of public health and Federal staffs. Other publications of the Center comprise the quarterly Center Newsletter mailed to 6,314 names on the mailing list, eight health planning monographs and ten bibliographies. The Center supplied 7,500 publications to planning and Federal agencies and to other institutions and individuals on demand. NTIS provides primary paper copy satisfaction for Center documents for which the requestor pays the cost.

The Center responded to 3,018 substantive reference inquiries in an average time of 1.6 hours each. The average lag time required to process a subject request is 10.4 days. For further information, contact: Calvin Meadows, HRA, Bureau of Health Planning and Resources Development, Federal Building No. 2, 3700 East West Highway, Hyattsville, Maryland 20782, (301) 436-6733

NATIONAL INSTITUTE OF EDUCATION

The Education Amendments Act of 1972 authorized the creation of the National Institute of Education to foster the following activities:

- Help to solve or alleviate the problems of American education and to promote its reform and renewal
- Advance the practice of education as an art, science and profession
- Strengthen the scientific and technological foundations of education
- Build an effective educational research and development system.

The Institute is authorized to conduct educational research, train individuals and collect and disseminate relevant findings. In addition, the Institute offers assistance for research, collection, dissemination or training through grants or technical assistance to public or private organizations as well as to individuals. Furthermore, the Institute promotes the coordination and support of research within the Federal Government; it also provides for the appropriate facilities needed to accomplish its objectives.

EDUCATIONAL RESOURCES INFORMATION CENTER

The Educational Resources Information Center (ERIC) within the Institute performs the task of collecting and disseminating research results. More specifically, ERIC's mission is to acquire, screen, abstract, index and disseminate technical information in the field of education. In addition to educational researchers, ERIC users include teachers, administrators, boards of education, legislators, education students and community groups.

ERIC products include a monthly bulletin, *Resources in Education* (RIE), which contains the announcement of documents acquired and processed into the system. A large percentage of documents announced in RIE are available in the form of microfiche or as hardcopy. Other ERIC products and services include the *Current Index to Journals in Education* (published monthly by MacMillan Information), tapes of the ERIC data base and a variety of special information products generated from the ERIC data base by private companies.

In December 1976, the ERIC file contained more than 269,000 citations, over 127,000 of which were technical documents cited in *Resources in Education*; the remainder were journal article citations in the *Current Index to Journals in Education*.

The major components of the ERIC system include the following:

- the ERIC facility
- 16 subject-oriented clearinghouses
- the ERIC Document Reproduction Service.

In addition to processing the document, each clearinghouse also develops information analysis products and provides such services as answering questions from users, training in the use of ERIC and referrals.

The minimum number of annual ERIC users is 12 million, with an approximate breakdown, as follows:

- Students in higher education (60 percent)
- Educational practitioners and decisionmakers (25 percent)
- Educational researchers (5 percent)
- Miscellaneous (10 percent)

Although these figures would suggest that researchers make relatively little use of ERIC, recent estimates indicate that the equivalent of only 10,000 full-time persons are engaged in educational research in the United States.

Approximately 615 organizations and agencies maintain a complete collection of all ERIC documents. Of these, the great majority are in institutions of higher education. Fifty-two are in foreign countries, and most of the remainder may be found in State or local education agencies. Approximately 4,600 subscriptions to *Resources in Education* were sold in 1976, as were 1,900 subscriptions to *Current Index to Journals in Education*. Seventeen million ERIC microfiche are sold annually. Most are acquired as parts of standing orders for the entire ERIC collection, but some 60,000 microfiche titles are purchased on a demand basis annually, and a similar number of titles are purchased in hardcopy. Some 500 agencies have computer access to the ERIC file.

The private individual who manually searches *Resources in Education* and then checks the microfiche file makes the most common use of ERIC resources. But there is an increasing trend toward the development of special information service centers in institutions of higher education, State and local educational agencies, and intermediate service units. These centers usually have an active outreach program. Commonly provided services include response to queries, search and retrieval, microfiche and hardcopy production, client debriefing and referrals. Increasingly, these centers are beginning to develop their own files to augment ERIC--human resources files for referral of clients to sources of special expertise.

The centers are also relying upon computer searching to meet client requirements. Although batch searching is common, approximately 2,500 centers currently subscribe to interactive search services which provide access to the ERIC file and a number of other files which are of benefit to educators.

ERIC did not expand its range of services and products in 1976; however, it initiated a pilot project in conjunction with major professional educational societies to explore means of enhancing collaborative development of mutual dissemination program efforts. The improvement of quality control measures and accessibility was also emphasized. For more information concerning ERIC, contact: Charles W. Hoover, National Institute of Education, 1200 19th Street, N.W., Washington, D.C. 20208, (202) 254-5555.

NATIONAL INSTITUTES OF HEALTH

The mission of the National Institutes of Health (NIH) is to conduct and support research into human diseases. Numerous pieces of legislation dating back to 1899, as well as the Public Health Service Act (42 U.S.C.), include a statement of this mission. A series of legislative enactments and administrative changes following World War II established the complex of research institutes that first comprised NIH. In 1968, the National Library of Medicine became a major component of NIH, thus completing the present organization. The Library's statutory mandate is to make biomedical information available to investigators, educators and medical practitioners.

Incorporation of the library into NIH provided special focus for dissemination of scientific and technological efforts and strengthened the NIH contributions in this field. In addition to the Library, NIH consists of 11 research institutes, the Clinical Center (a 500-bed research hospital) and 4 divisions constituting the National Institutes of Health.

NATIONAL LIBRARY OF MEDICINE

The National Library of Medicine (NLM) received a special appropriation of 26 million in 1976 for the construction of a Lister Hill Center building. Established within NLM to carry out research and development in biomedical communications, the Lister Hill National Center for Biomedical Communications has existed as an organization since 1968. The new building, scheduled for completion in late 1979, will house not only the staff of the Lister Hill Center but also the National Medical Audiovisual Center, Extramural Programs, the Toxicology Information Program and the Medical Literature Analysis and Retrieval System (MEDLARS) computers.

Three more countries entered into partnership arrangements with the Library in 1976 for MEDLARS On-Line (MEDLARS/MEDLINE) cooperation, i.e., Iran, Mexico and South Africa. Eleven such partnership arrangements now exist. In return for direct access to NLM's computers in Bethesda, Maryland, the three countries provide indexing input for the MEDLARS data base. Additionally, NLM trained each country's staff from the MEDLARS/MEDLINE Centers.

In June 1976, Martin M. Cummings, M.D., NLM Director, headed the U.S. delegation invited to the Soviet Union under the aegis of the U.S./U.S.S.R. Agreement for Cooperation in Medical Science and Public Health. The Agreement identifies biomedical communications as an area of possible cooperation. Discussions with Soviet officials resulted in an oral agreement to consider the following areas for cooperation: exchange of biomedical literature, interlibrary loan using the Telex linkage between the Soviet Ministry of Health and DHEW for requests and exchange of personnel in the specialties of nomenclature or indexing.

In 1976, NLM began placing its publications and MEDLARS data bases under copyright protection outside of the United States. The NLM Board of Regents authorized this action with the concurrence of the DHEW General Counsel and the Register of Copyrights.

Library Operations

Beginning in May, *Index Medicus* and MEDLARS/MEDLINE included selected congresses, symposia, proceedings and multi-authored monographs. Each paper or chapter is indexed to include title, author(s) and pagination, as well as identification of the source volume. The MEDLINE data base increased by 267,000 citations during the year, an addition that raised the total number to 2,787,000.

Two new on-line data bases implemented in 1976 are CANCERPROJ (ongoing cancer research projects and clinical trials), a cooperative effort between NLM and the National Cancer Institute, and EPILEPSYLINE (citations and abstracts relating to epilepsy), in cooperation with the National Institute of Neurological and Communicative Disorders and Stroke. By the end of the year, CANCERPROJ contained about 16,000 entries; EPILEPSYLINE, about 20,000.

Early in the year, the Library's main reading room acquired seven learning carrels which contain more than 3,000 instructional programs in 3/4 inch videocassette, slide/tape, and 16mm film formats. Further acquisitions consist of the microform playback devices installed in the special area set aside for the carrels.

Statistics for NLM Operations for Fiscal Year 1976 (ending June 30, 1976) are as follows:

Monographs	
- Before 1971	79,625
- 1871-present	353,198
- Theses	281,295
- Pamphlets	172,021
- Bound serial volumes	510,785
- Microforms	30,158
- Audiovisuals (excluding National Medical Audiovisual Center)	3,291
- Pictures	71,600
- Manuscripts	743,100
- Serial Titles received	18,086
- Items cataloged	15,044
- Articles indexed for MEDLARS	255,000
Circulation requests filled	
- For interlibrary loan	205,695
- For readers	96,270
- Reference requests	32,334
- On-line searches (all data bases)	578,600

The items cataloged in 1976 were added to the CATLINE (CATaloging on-LINE) data base, increasing its total content to 175,000 entries.

Toxicology Information Program

The NLM Toxicology Information Program, established in 1967, began publishing two new aids to researchers

in toxicology--the quarterly *Toxicology Research Projects Directory* and *Toxicology Testing in Progress* (TOX-TIPS). Both are experimental publications, sponsored jointly by NLM and the DHEW Committee to Coordinate Toxicology and Related Projects. Each issue of the *Directory* contains descriptions of about 2,500 ongoing, federally supported toxicological research projects, drawn from the computerized files of the Smithsonian Science Information Exchange. TOX-TIPS is an alerting service to inform researchers of the chemical substances on which industry and Government laboratories are performing long term tests.

Another cooperative project is the development of a Laboratory Animal Data Bank. This data bank will become an on-line interactive data retrieval service which will aid in choosing species and strains of laboratory animals used in research. Thus far, the file, in preliminary testing, contains data on 19 strains of laboratory animals.

The Program added 100,000 citations to the TOXLINE data base in 1976; this data base now contains 574,000 citations in the field of toxicology.

Lister Hill National Center for Biomedical Communication

Three agencies of the Public Health Service will conduct communication experiments on the powerful new Canadian-American Communications Technology Satellite (CTS) launched in 1976. The Lister Hill Center is providing technical planning and coordination for these communication experiments.

Experience with the Lister Hill Center's Computer-Assisted Instruction Network brought out the need to provide the academic and professional communities with a "window" to the world of computer-based educational materials.

The Learning Resource Laboratory, completed in the past year within the Library, constitutes such a "window". The Laboratory is equipped with a mini-computer, microprocessing equipment and the most modern communications terminals and display equipment. The Learning Resource Laboratory affords the Lister Hill Center an environment in which to develop its programs and provides a demonstration/learning resource for the biomedical community. The Center has two goals in this area: 1) to provide technical consultation and research and development support to the internal elements of the Library; and 2) to establish a research, development and applications program responsive to the information processing needs of the health community, particularly to those of health educators.

National Medical Audiovisual Center

The National Medical Audiovisual Center (NMAC), a component of the Library since 1967, is located in Atlanta, Georgia. The Center encourages the development and use of effective audiovisual materials in both undergraduate and continuing education for health professionals.

In 1976, progress continued on the Library's data base known as AVLINE (Audiovisuals On-Line). AVLINE, described in the *1975 Progress Report*, has grown to over 2,000 records and is available to all institutions with access to MEDLINE. Requests for loans of audiovisuals numbered 72,500 during the year; over 60,000 films and videotapes were shipped in response to these requests.

The Center's entire archival motion picture collection--some 1,000 titles, many of which are irreplaceable--is being transferred to videotape.

Extramural Programs

The Library's grant program assists medical libraries to develop better health information services, particularly services that relate to a biomedical information network. NLM makes grants available for resource improvement and for resource projects, training, research and special scientific projects, as well as for the support of domestic and foreign publications. In addition, contracts administered by the Extramural Programs support the operation of ten Regional Medical Libraries. For the year ending June 30, 1976, 112 grants and contracts received a total of 6.3 million, including 2.7 million for the Regional Medical Libraries.

For more information on NLA science information activities, contact: Melvin S. Day, Deputy Director, National Library of Medicine, 8600 Rockville Pike, Bethesda, Maryland 20014, (301) 496-6661.

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

The Housing and Urban Development (HUD) Act of 1965 provided for the establishment of a cabinet-level department which would combine the efforts of all Federal agencies then dealing with the myriad problems of housing and urban development. This act, together with later legislative and executive policy statements, has defined HUD's major goals as the following:

- to provide an opportunity for decent housing for every American family

- to promote a suitable living environment for every American family

- to strengthen the capability of State and local government to meet public needs.

Title V of the Housing and Urban Development Act unified HUD's research activity in 1970. This title directed the Secretary of Housing and Urban Development to undertake such programs as research, studies, testing and demonstration relating to the mission and program of the Department.

In addition, Section 501 of the same title authorized the Secretary to provide reports on HUD activities and undertakings to departments, establishments and agencies of Federal, State and local governments as well as to industry and to the general public.

LIBRARY DIVISION

During the year, the HUD Library persevered in its mission to provide a wide spectrum of library and technical information services in housing and community development (broadly interpreted) to those in or out of the Government who require such services. A Washington, D.C. facility and a network of libraries in each of ten Regional and many Area Offices carried out these activities with the objective to make information both available and easily accessible.

Augmenting the usual reference, circulation, routing of journals and preparation of bibliographies functions, emphasis is placed on interfacing with a variety of outside sources and on the more innovative information handling and delivery technologies. All of the Library's cataloging was performed in the cooperative FEDLINK (Federal Library and Information Network) arrangement with the computerized Ohio College Library Center system. To further expand the Library's capabilities, commercial, on-line data base search services, such as Lockheed DIALOG, System Development Corporation ORBIT and the New York Times Information Bank have been acquired. The Selective Dissemination of Information program has been expanded and semiautomated.

Participation and leadership in the Federal Interagency Field Librarians' Workshop continued throughout 1976. The Library Director also served as Chairman of the Federal Library Committee Panel on Field Libraries.

For current awareness, the Library instituted a new biweekly publication for HUD staff in Headquarters and the field entitled "HUD Library Recent Acquisitions". The more comprehensive "Housing and Planning References" continued to be issued and is available through subscription from GPO. Overall, HUD distributed 10,100 sets of the latter title.

Together with the Office of Policy Development and Research, the Library was developing a program to establish a HUD-sponsored research report data bank and report dissemination capability. Additionally, with the Microfilm Corporation of America, the Library initiated a project to microfilm noncopyrighted housing materials, including HUD and HUD-supported documents, as well as to announce them and to make the microforms available for procurement.

The Library also issued several annotated, selective bibliographies which included such publications as *Zero-Based Budgeting, Defensible Space and Security, Land Use Resources, Davis-Bacon Act, Buying, Maintaining and Selling A Home* and *Redlining*, as well as prepared a revised *HUD Library Periodicals List*. For further information, contact: Mrs. Elsa S. Freeman, Director, Library Division, Department of Housing and Urban Development, Washington, D.C. 20410 (202) 755-6376.

OFFICE OF COMMUNITY PLANNING AND DEVELOPMENT

In an effort to provide current and useful information to Congress, HUD managers, program participants and public interest groups, the Office of Community Planning and Development (CPD) continued its program of publications and information dissemination.

In February 1976, the President's biennial *Report on National Growth and Development* was submitted to the Congress pursuant to Section 703, Title VII of the Housing Act of 1970. The Growth Report, with supplemental materials, was part of the U.S. presentation at HABITAT, the United Nations Conference on Human Settlements. HUD also produced two films for HABITAT on designing the urban environment and citizen involvement as well as a slide show on energy conservation.

In March 1976, CPD's 701 Comprehensive Planning Program in cooperation with the Federal Energy Administration published a program guide for states and communities concerned about the management of growth in areas affected by major energy projects. The publication shares with communities ideas for action based on actual experiences besides pointing out sources of help for information, planning and financial assistance.

CPD's Office of Evaluation prepared several special reports during 1976. In August, it published a report entitled,

Community Development Block Grant Entitlement Cities: The First Year Planning and Application Process. This report summarized the results of a Community Development Funding Survey for 880 entitlement cities responding to the questionnaire. The report analyzed the experiences of these cities in the planning and application processes for the first year of the Community Development Block Grant (CDBG) program.

In November 1976, CPD's Office of Evaluation published another report entitled, *A-95 Project Notification and Review System: An Evaluation Related to Community Development.* This report examined the effect of the A-95 process on the development of the CDBG entitlement applications and programs and the issues and problems in the A-95 process which needed to be changed. As a result of this report's recommendations, Congress enacted legislation to strengthen A-95 as a management tool both for HUD and the entitlement recipients.

On December 30, 1976, pursuant to Section 113 of the 1974 Housing Act, the Secretary of Housing and Urban Development forwarded to Congress the *Community Development Block Grant (CDBG) Program Second Annual Report*. Title I of the Act consolidated seven existing categorical grant-in-aid programs administered by HUD (I.e., Urban Renewal, Model Cities, Water and Sewer, Open Space, Neighborhood Facilities, Rehabilitation Loan and Public Facilities Loan). The report compared experiences in the first and second years of the CDBG Program and demonstrated substantial changes that occurred during this period in the uses which local governments are making of block grant funds. Additionally, the report discussed the continued progress made in accomplishing CDBG objectives, besides the use of the FY 76 appropriation of approximately 5.08 billion in funds for over 4,500 communities during the two program years. The recipients of these funds were 513 metropolitan cities, 740 small communities, 76 urban counties and over 3,400 discretionary communities.

During the summer of 1976, staff members from a broad range of Federal agencies with responsibilities for various citizen participation programs formed the Interagency Council on Citizen Participation. The impetus was a desire to share ideas, techniques, publications, problems and solutions. All Federal employees with a responsibility or an interest in citizen participation programs can obtain membership in the Council.

The Council, with the support of the Federal Office of Consumer Affairs, held its first seminar December 8-9, 1976. Two major issues surfaced during the Conference. The first, public constraint in working with the Government consists of four problem categories: public knowledge and understanding, participation difficulties, predisposition of the public and social and cultural constraints.

The other issue--Government restrictions in working with the public--consists of the following five problem categories: authority and responsibility, resources, notification and commitment of leadership and management, participatory processes and skills and public apathy or nonparticipation.

The Council met on a monthly basis and during the course of its January meeting began to address the issues which surfaced at the Conference and began to identify potential solutions. For more information, contact: Mrs. Elsa S. Freeman, Director, Library Division, Department of Housing and Urban Development, Washington, D.C. 20410, (202) 755-6376.

OFFICE OF INTERNATIONAL AFFAIRS

The Office of International Affairs, HUD, addresses the international interests of the U.S. Government in the fields of housing, urban development and other related areas. Its responsibilities include representing the U.S. Government at international meetings; gathering, analyzing and disseminating information from other countries of interest to the Department; representing the professional community and the private sector; supporting the foreign policy and trade promotion activities of the Departments of State and Commerce; and developing professional programs for international visitors.

In June 1976, the Office participated in HABITAT, the UN World Conference on Human Settlements, held in Vancouver, B.C. HUD's Secretary led the U.S. delegation to HABITAT on which the Office of International Affairs spent two years in support of HUD offices and other Federal agencies. Also during the year, the Office arranged for participation both from within the Department and from private sectors in the work program of the UN Economic Commission for Europe's Committee on Housing, Building and Planning. In all, approximately 25 officials participated in conferences on such topics as urban transportation, urban and regional research and housing needs of special groups.

The Department has also led in the work of the Urban Environment Group of the Organization for Economic Cooperation and Development (OECD) in Paris. During the past year, the Group focused on such topics as land use controls for noise abatement, development of environmental indicators for improved quality of urban life and analyses of environmental impact assessment procedures in member nations. International Affairs staff not only prepared papers but also aided in the selection of U.S. participants in the meetings. Additionally, the staff aided in the development of policy for the current round of General Agreement on Tariffs and Trade (GATT) negotiations by assessing the effect of the proposed standards code on the housing and building industry and on the Department itself.

Activities resulting from the U.S./U.S.S.R. Agreement of Housing and Other Construction, signed in June 1974, greatly expanded during the year. All six U.S. Working Groups under the Agreement held their first joint meetings with Soviet counterparts; the Groups also negotiated six project-level exchanges. In addition, 15 HUD officials, over 50 officials from other Government agencies and more than 70 representatives from industry participated in the exchanges. Discussion centered primarily on such topics as new towns, construction management, construction in extreme climates and building materials. Furthermore, 53 projects and subprojects are in progress under the Agreement and during the course of the year, the United States received 36 Soviet officials in seven teams.

In other bilateral activities, the Office initiated several activities to obtain useful foreign information and benefit from foreign experience. Agreements for information exchange are now in force with the United Kingdom, Sweden, France, Spain, the Federal Republic of Germany, Iran, Japan and the U.S.S.R.

As an extension to the establishment of the U.S./Iran Working Group on Housing 1975, the Office chaired working group meetings held in Iran and the United States. In addition, the development of new programs have increased U.S. exports of technical assistance and housing hardware. The Office is currently conducting seminars on housing finance and housing management. As part of the Office's continued efforts to assist U.S. businessmen in overseas activities, more than 500 coporations and businessmen received guidance in export promotion on request. The addition of a computer terminal and the filming of 5,000-6,000 research documents will expand the capabilities of the Office's foreign information retrieval system. This system also feeds into the publication program of the Office, resulting in four different series--the International Information Series (newsletter), International

Special Reports (in-depth studies on a specific subject), International Information Sources Series (bibliography) and Country Profiles (studies of housing and urban development policies of other nations). New profiles are also available on Iran, Saudi Arabia, Kuwait, United Arab Emirates, Nigeria, Brazil, Mexico, Canada, Federal Republic of Germany and Colombia.

Responses to written requests for information totalled more than 2,200 during the year, and Office personnel prepared 172 special bibliographies from the information system for researchers, professionals, non-Government organizations, special interest groups and Congress. Since its appointment as the United Nations human settlements center for the International Referral Service (IRS) of the United Nations Environment Programs, the Office has identified major data sources to the IRS headquarters in Nairobi, Kenya. Programs were also prepared for over 1,364 visitors from 47 countries. These visitors included Government policy and program officials as well as housing and urban development professionals. For further information, contact: T. R. Callaway, Director, Technology and Documentation Division, Office of International Affairs, HUD, Washington, D.C. 20410, (202) 755-5770.

OFFICE OF POLICY DEVELOPMENT AND RESEARCH

Current and accurate technical, economic and financial data pertaining to housing and urban development are essential to informed decisionmaking by both consumers and industry, besides being important factors not only in the formulation of policy, but also in the development, management and evaluation of programs by Federal, State and local governments. Furthermore, the data collected must be relevant and available to those with the need to learn.

HUD develops and analyzes major data series relating to national housing market conditions as well as housing and mortgage market trends. The Annual Housing Survey measures changes in the U.S. housing inventory and compiles data on the physical condition of housing units and the characteristics of occupants in both urban and rural areas. Moreover, surveys on housing production provide monthly or quarterly data on new housing from construction process initiation to sale or rental of the completed unit. Finally, the Monthly Surveys of Mortgage Lending collect data on mortgage investment activities in addition to the sources and uses of mortgage funding.

Heating and Cooling Information Center

In 1976, HUD established in cooperation with ERDA a National Solar Heating and Cooling Information Center which serves as a sing'e vantage point for the collection and dissemination of information on the solar heating and cooling of residences. Center staff suitably package data for each category of potential user (e.g., builders, developers, consumers). Moreover, an indication of the keen interest in solar energy is the fact that the National Center is receiving approximately 2,280 pieces of mail and 2,250 telephone calls per week.

OTHER ACTIVITIES

In addition to many other Federal agencies, HUD participated in the U.S. Bicentennial Exposition on Science and Technology throughout the summer of 1976. HUD's exhibit, entitled "America: A Nation of Communities", was a showcase of HUD science and technology activities which included many research findings. Due to this exhibit, approximately 600,000 visitors reviewed information about current HUD technology.

HUD also initiated a project to launch a dissemination effort for the lead-based paint hazard abatement program. Program elements comprise an information clearinghouse as well as a technical assistance program for State and local governments. This assistance focuses on the areas of improved techniques in lead paint detection and elimination.

During the year, the Office completed a study on the feasibility of establishing a data bank for statistics emanating from HUD's Experimental Housing Allowance Program. The purpose of this experimental program was to test the possibility of supplying direct cash assistance in order to provide needy families with decent, safe and sanitary housing. If established, this information service will provide data from the experiment for research groups for study and analysis.

A comprehensive data bank is also under development for the identification, cataloging, abstracting and publication of reports resulting from all HUD-sponsored research activities. The data base will include a variety of publications together with a complete compendium of major research documents. For further information, contact: Susan Livingston, Director, Division of Product Dissemination & Transfer, Office of Policy Development and Research, Department of Housing and Urban Development, Washington, D.C. 20410 (202) 755-5547.

DEPARTMENT OF THE INTERIOR

The Department of the Interior is concerned with the management, conservation and development of the natural resources of the United States. These resource areas include the public lands, minerals, fish and wildlife, parks, recreation, water, energy and power development. It also has major responsibilities for Indian and Territorial affairs.

BUREAU OF MINES

The *Minerals Yearbook* is a three-volume annual statistical publication of the Bureau of Mines in which production, consumption and trade data on minerals, metals and fuels are compiled. A narrative summary of significant developments in included in each chapter. Volume I presents domestic and world data on a commodity basis; Volume II presents the data on a state-by-state basis; and Volume III contains data on foreign countries. The Yearbook may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Commodity Data Summaries is the earliest Government publication to furnish coordinated production, consumption and trade estimates for the preceeding year on 95 mineral, metal and fuel commodities. These summaries are available free of charge from Bureau of Mines, 4800 Forbes Avenue, Pittsburgh, Pennsylvania 15213.

Minerals & Materials, A Monthly Survey presents current production, consumption, foreign trade inventory and price data on 18 significant mineral and fuel commodities. *Commodity Data Summaries Minerals & Materials* is available from the Bureau of Mines free of charge. A recently added feature is mineral information at the State level reported by the State Liaison Officers.

The Bureau has two major information storage and retrieval facilities--the Minerals Availability System (MAS) and the Fuels Availability System (FAS). MAS is a non-fuel mineral supply analysis program that systematically identifies and classifies mineral reserves and estimates their present and potential availability to the Nation. FAS is an energy data system that collects and processes data on coal, petroleum and natural gas and related data for rapid retrieval and analytical purposes.

Under formal working agreements with the Federal Energy Administration (FEA), the Bureau of Mines is the collection agent for selected coal and petroleum data. The fact that the data collected serves both agencies reduces the reporting burden on responders. The Bureau is responsible for collecting, editing, validating and providing the data to FEA in machine-readable form. Data collected under these agreements are incorporated into the Fuels Availability System which then disseminates the information through several types of Bureau publications.

Mineral Facts and Problems, published by the Bureau every five years, serves as an authoritative encyclopedia of mineral supply/demand information and of technology for the mining, processing and use of 88 mineral commodities. This publication provides information concerning trends in recent decades, current developments and forecasts, and projections for the years 1985 and 2000. Major commodity chapters are continuously updated and expanded in the new Mineral Commodity Profile series.

Historical, current and future supply/demand relationships for the major mineral and fuel commodities are presented annually in a summary table form in the Bureau of Mines publication "Mineral Trends and Forecasts". Latest available data on U.S. and world mineral reserves and resources are compared with forecasts of cumulative demand through the years 1985 and 2000 for the purpose of identifying short and long term mineral supply problem areas and analyzing the adequacy of future mineral supplies.

A concise 10-year, statistical supply/demand profile for the major mineral and fuel commodities in the United States is presented annually in the Bureau of Mines publication "Minerals in the U.S. Economy". The report covers 88 key mineral and fuel commodities including 47 metals, 32 nonmetals and 5 fuels. Annual statistics for the decade covered are tabulated on U.S. and world output, foreign and domestic components of the U.S. supply and demand by major use categories. Flow diagrams for each commodity show, at a glance, relationships among international suppliers, U.S. imports, domestic production, Government and industry stockpiles and consumption categories.

Two new series of reports are *Mineral Commodity Profiles* and *Mineral Perspectives*. *Mineral Commodity Profiles* present the latest, up-to-date data on important minerals, including background material on industry structure, technology and reserves, timely economic and production data and forecasts of future supply demand relationships and uses. Recent issues are "Chromium--1977", "Phosphate--1977', and "Copper--1977". This series supplements the *Minerals Yearbook* and *Mineral Facts and Problems*.

Mineral Perspectives cover a particular state of the United States, or a particular foreign country or region of the world. They present the latest available data on commodities that are of critical importance. "Far East and South Asia" is a recent report in this series.

All of the Bureau's significant research findings are reported as Reports of Investigation. These reports include projects conducted as intramural efforts and those primarily conducted by universities and other organizations under contract. The results of some research projects are also reported in scientific and engineering journals. Economic studies of various mineral commodities, including fossil fuels, are published as Information Circulars as are studies on the cost of mining or processing of commodities. The Bureau annually publishes a report of ongoing and completed projects which contains a bibliography of all publications of that year and the two previous years (e.g., Reports of Investigations, Information Circulars, outside articles). The 1976 review is entitled "Research 76". Reports of studies of limited interest are placed as open-file reports. Such open-file reports are an-

nounced in press releases; they are included in the annual list of Bureau of Mines publications and articles. For additional information, contact: Mr. Robert Swenarton, Chief, Office of Mineral Information, Bureau of Mines, Department of the Interior, 2401 E Street, N.W., Washington, D.C. 20241, (202) 634-1001.

BUREAU OF OUTDOOR RECREATION

The Bureau of Outdoor Recreation operates the Outdoor Recreation Technical Assistance Clearinghouse. This program consists of a data base of technical materials, including Federal, State and local laws; technical publications and recreation research reports; a quarterly report to recreation professionals, entitled *Outdoor Recreation Action*; and an indexing-retrieval system designed to locate programs, research and technical materials pertaining to some 35 recreation subjects.

Individuals or organizations wishing to use the Clearinghouse should request information by subject, giving specific details of their need. The requester receives copies of available Bureau of Outdoor Recreation publications, a list of other materials with abstracts of their contents, identification of Government or private sources of data and expertise on the particular problem posed and when funds and staff permit, direct project assistance by recreation professionals. There is no charge for the service.

The Bureau's periodical, *Outdoor Recreation Action* , reports major Federal, State, local and private outdoor recreation and related environmental quality actions. This publication provides mass distribution of the best materials available in the Outdoor Recreation Technical Assistance Clearinghouse. The *Action* Reports are available free to Government agencies and officials; private organizations and individuals may subscribe prepaid from the Superintendent of Documents. For additional information, contact: Margaret Stelmak, Division of Cooperative Services, Bureau of Outdoor Recreation, Department of the Interior, Washington, D.C. 20240, (202) 343-7962.

BUREAU OF RECLAMATION

The Bureau of Reclamation sustains a substantial technical information activity designed to meet its in-house requirements and to contribute to the body of knowledge in the field of water resources development. Output includes design standards, manuals, monographs, pamphlets, research reports and brochures. The Bureau is involved in audiovisual media, i.e., preparing slide shows, videotapes, exhibits and displays. Special library services are available to all Bureau employees from its Engineering and Research Center Library in Denver, Colorado, where increasing use is being made of computerized data bases which greatly enhance the information retrieval process.

During 1976 Reclamation published "Design of Gravity Dams", a new design manual for concrete gravity dams, and the third edition of the "Paint Manual", a manual for the control of protective coatings and their applications. Also issued during the year were 46 reports in the Bureau's REC-ERC and GR Report Series, which presented the results of research studies undertaken by the Bureau's Division of General Research, and 67 miscellaneous reports including environmental impact statements, reports for foreign governments and training manuals.

A biannually published catalog, "Publications for Sale", lists technical water resource publications of the Bureau which are available to the public from GPO and the Bureau's Engineering and Research Center in Denver.

An exchange program for technical information pertaining to water resource development is maintained by the Bureau of Reclamation. This program involves some 230 Government agencies, academic institutions and other scientific organizations in 53 countries, and new foreign participants are added to the program each year. For additional information, contact: Harley J. Warren, Chief, Technical Services and Publications Branch, Bureau of Reclamation, Department of the Interior, Room 490, Building 67, Denver Federal Center, P.O. Box 25007, Denver, Colorado 80225, (303) 234-3022.

MINING ENFORCEMENT AND SAFETY ADMINISTRATION

The Mining Enforcement and Safety Administration (MESA) is heavily committed to engineering and technical studies to enhance health and safety in American mines. These studies come in the form of statistical analyses, equipment testing and studies of environmental factors influencing health and safety in both surface and underground mining.

A joint two-year mine environmental and medical study with the National Institute of Occupational Safety and Health (NIOSH), Department of Health, Education, and Welfare, was implemented early in 1976. The study, covering 19 mines with 7,000 miners, aimed at establishing a definitive correlation between the mine environment and the miner's health.

A semiannual listing of the publications of the Mining Enforcement and Safety Administration is available from the MESA Office of Information, Ballston Tower #3, 4015 Wilson Boulevard, Arlington, Virginia 22203. MESA publications appear in the following forms:

- Safety Reviews, published periodically, contain statistical summaries of fatalities, injuries, and fatality and injury frequency rates in the coal mining, metal, nonmetal, stone, and sand and gravel industries. Copies may be obtained from MESA, Office of Information.

- Instruction Guides contain an outline of material to be covered by instructors teaching each MESA safety training course for miners. They may be obtained by writing MESA, Office of Information.

- Pocket Guides published in the form of booklets and covering briefly the same material as a refresher, are given to participants who have completed MESA health and safety training courses. They may be obtained from MESA, Office of Information.

- Information Reports (IR's) include engineering studies, measurements, verification studies, casualty causation statistical studies, and a variety of other studies in the area of mining health and safety. Eighteen such IR's were published in 1976. They may be obtained from MESA, Office of Information.

- Safety Manuals are available on various health and safety topics. They are written in nontechnical layman's language. Copies may be obtained from the Superintendent of Documents.

- Health and Safety Reports are illustrated analyses of fatal accidents, with recommendations on the prevention of such accidents. Copies may be obtained from the Superintendent of Documents.

- Open-File Reports encompass special studies in fields which affect the health and safety of miners. They are available for inspection during working hours at MESA Headquarters. Some File Reports are available for purchase from NTIS, Springfield, Virginia 22161.

In addition to the above listed publications, MESA's Coal Mine Health and Safety activity and Metal and Non-

metal Mine Health and Safety activity prepare annual reports on their enforcement responsibilities which form a part of the annual report of the Secretary of the Interior to Congress. Included in these reports are listings of additional scientific studies which may not be published as IR's. Copies may be obtained from the Superintendent of Documents.

In November 1975, the Mining Enforcement and Safety Administration published the first issue of "MESA--The Magazine of Mining Health and Safety", a new bimonthly publication devoted to improving health and safety conditions in the mining industry. It includes the most recent listing of mining equipment approvals by MESA. Copies may be purchased through the Superintendent of Documents. For further information, contact: Richard Nellius, Chief, Office of Information, Mining Enforcement and Safety Administration, Department of the Interior, Ballston Tower #3, Room 515, 4015 Wilson Boulevard, Arlington, Virginia 22203, (703) 235-1452

OFFICE OF LIBRARY AND INFORMATION SERVICES

Within the Office of Library and Information Services is the National Natural Resources Library and Information System (NNRLIS) consisting of over 400 library/information centers. The Natural Resources Library in Washington, D.C., the lead library, has approximately 800,000 volumes, 9,000 periodical titles and 7,000 serial titles. The field libraries and information centers which are located throughout the country serve the various bureaus and offices of the Department.

Recognizing the impact of the "information explosion" on scientists and engineers, the Interior organized NNRLIS during 1975. NNRLIS equalizes the availability of library materials and information to Department personnel regardless of organizational affiliation or geographic location and greatly increases the scope and depth of library materials and services to users. This increase becomes exceedingly important to contemporary needs which tend to be multidisciplinary. Modern systems and technology are used to facilitate the acquisition and transfer of information; most of the modules for this system are already in place at the Natural Resources Library. In-place systems include document delivery, on-line search services, an automated acquisition system and computer-assisted cataloging of books. In the field, some modules are being upgraded, while others are under development.

The subjects included in NNRLIS encompass all areas of concern to the Department in its work to manage, conserve and develop the natural resources of the United States. Services offered to department personnel include reference assistance, library material loan, document delivery, translations, referral, bibliographies and on-line literature searches. The Natural Resources Library has access to data bases in engineering, chemistry, agriculture, petroleum, management information and other subject areas.

An integral part of information transfer is close working relationships with other sources of information. The Office cooperates with numerous other Government agencies in the information field. For additional information, contact: Mary A. Huffer, The Office of Library and Information Services, Department of the Interior, Washington, D.C. 20240, (202) 343-5821.

OFFICE OF WATER RESEARCH AND TECHNOLOGY

The Office of Water Research and Technology (OWRT) was created when the Office of Water Resources Research and the Office of Saline Water were consolidated under the Assistant Secretary for Land and Water Resources, by Order No. 2966, of the Secretary of the Interior, July 26, 1974. OWRT provides a broad-based organization for water resources research and development programs. It also encourages programs of research in all fields of water resources and the scientific information activities that serve the water resources community.

The Water Resources Scientific Information Center (WRSIC) is a major organizational component of OWRT. In 1976, the WRSIC data base grew by 13,200 citations to 104,000 abstracts in water resources and is available for on-line search and retrieval through the ERDA/RECON system. WRSIC users can also search some of the other data bases included in the ERDA/RECON system (in accordance with existing interagency agreements). To serve the four major regions of the United States, remote terminals have been installed at four regional State Water Resources Research Institutes. Other State Water Resources Research Institutes have remote terminals to provide computer searches on an intra-state basis. Overall, 11 terminals at the regional institutes have been used to perform the total of 1,600 searches during 1976. Three Interior agencies have direct access to the WRSIC data base--Geological Survey, Fish and Wildlife Service, and Bureau of Reclamation. Also, the WRSIC data base is extensively utilized by EPA to acquire water quality information.

The latest volume (No. 11) in the Water Resources Research Catalog series was issued, as were the following bibliographies: "Public Participation in Water Resource Development"; volume 7 of "Analysis of Water Resource Systems"; volume 5 of "Water Reuse"; volume 2 of "DDT in Water"; "Agricultural Runoff"; volumes 2 and 3 of "Estuarine Pollution"; and volume 2 of "Irrigation Efficiency". For further information, contact: Raymond A. Jensen, Manager, Water Resources Scientific Information Center, Department of the Interior, Washington, D.C. 20240 (202) 343-8435.

UNITED STATES BOARD ON GEOGRAPHIC NAMES

The United States Board on Geographic Names (BGN) was established in its present form in 1947 for the purpose of providing a central authority to standardize geographic names for use by Federal agencies. Comprised of representatives from nine Government agencies, the Board operates through several committees organized along area lines, to recommend geographic names that, when given final approval by the Secretary of the Interior, become the standard names for U.S. purposes.

The permanent committees are the Domestic Names Committee, the Foreign Names Committee, the Executive Committee and the Publications Committee. Advisory committees are established to work on names that pose particular problems; currently, these include the Advisory Committee on Antarctic Names, the Advisory Committee on Undersea Features and the Advisory Committee on Extraterrestrial Features. These committees meet as needed, with the exception of the Domestic Names Committee, which meets monthly. While the committees are responsible for carrying out their missions with relative independence, they conduct their affairs under general guidelines established by the Board and report to the Board each quarter.

Board members and deputy members are appointed by the heads of their respective departments for two-year periods; the Chairman of the Board is appointed by the Secretary of the Interior. Each committee elects its respective officers.

BGN's work is disseminated to Federal agencies and other users by means of various publications. Domestic U.S. names appear in lists which are issued quarterly; foreign names are carried in a series of some 150 gazetteers which cover foreign countries and regions, undersea areas and Antarctica.

Staff personnel engaged in research and production required to standardize names is provided by the U.S. Geological Survey (in the case of domestic names) and the Defense Mapping Agency (in the case of foreign names), but members of the Board serve without compensation. The agencies also furnish name information in response to inquiries from Federal and non-Federal users.

The Board cooperates closely with both domestic and foreign standardizing bodies. BGN maintains relations with State and local organizations in the United States for the purpose of developing names and related information that conform to local usage and engages in long-range programs with foreign and international standardizing bodies. As a result of such cooperation with its counterpart in the United Kingdom, the Board has developed a number of systems to convert non-Roman written languages to the Roman alphabet. These systems, which are in use in many Roman-alphabet nations, have contributed significantly to the improvement of communications across language barriers. The Board is also represented in various UN organizations and by regional organizations for the purpose of standardizing names.

As one of its goals, the Board assists other nations in establishing national name-standardizing agencies. To this end, every attempt is made to provide advice and technical information to foreign authorities.

While geographic name information developed by BGN is designed chiefly for official United States use, its publications and file information have been extensively used by educational institutions, commercial publishers, and researchers in various scientific fields, both in this country and elsewhere. Gazetteers and lists of domestic names have been made available free of charge to qualified users.

BGN does not make decisions that are contrary to local usage. Within the United States, the Board normally engages in making decisions only when there is conflict in available evidence, or when a name is proposed for a feature that has no name. For information on U.S. domestic names, contact: Donald J. Orth, Executive Secretary for Domestic Geographic Names, National Center, Mail Stop 523, Reston, Virginia 22092 (703) 860-6261. Inquiries about BGN and about geographic names should be directed to Richard R. Randall, Executive Secretary, United States Board on Geographic Names, Defense Mapping Agency, Building 56, U.S. Naval Observatory, Washington, D.C. 20305, (202) 254-4453.

U.S. GEOLOGICAL SURVEY

In addition to the traditional information services provided by the Geological Survey Library and Public Inquiries Offices, the Geological Survey operates a number of STI programs which are aimed at encouraging the greatest possible use of existing earth science data in order to avoid costly duplication of data collection efforts. With the exception of the EROS Data Center which moved into permanent facilities at Sioux Falls, South Dakota, in early 1974, the Geological Survey Library, the National Water Data Exchange, the National Cartographic Information Center and other components of the Survey's STI programs are housed at the Geological Survey's new National Center in Reston, Virginia. For additional information, contact: Chief, Land Information and Analysis Office, U.S. Geological Survey, Department of the Interior, Mail Stop 104, Reston, Virginia 22092, (703) 860-7488.

Earth Resources Observation System (EROS)

As of December 31, 1976, two LANDSAT Earth resources satellites are in polar orbit around the Earth. The first satellite launched nearly five years ago is still functioning, but due to the failure of its tape recorder, this satellite has lost its capability of gathering data outside the range of the receiving stations. In addition, the green band of the MSS has failed, and its orbit has been alightly altered. The second satellite, LANDSAT-2, launched January 1975, is still working satisfactorily. The third satellite, now called LANDSAT-C, will be called LANDSAT-3 on launch sometime before March 1978. It will have the same polar orbit as the first two and will also have the same MSS configuration. In addition, LANDSAT-3 will carry a thermal band (10.5 - 12.5 microns, 75 meter resolution). Besides the receiving stations in the United States, Canada and Brazil, two new ones--one in Italy and one in Pakistan--have been added. Others are planned for Zaire, Norway and Japan. Other nations have expressed an interest in having receiving stations if an operational satellite is launched.

During the past year considerable advances have been made in computer enhancement of images. With the launch of the third satellite, all imagery will be digitally enhanced rather than photographically reproduced as is now the case. The digital enhancement will result in sharper pictures.

All data from the LANDSAT satellites, as well as from other manned satellites, and from NASA and U.S. Geological Survey aircraft, are archived at the EROS Data Center, Sioux Falls, South Dakota. As of December 31, 1976 these archives included more than 1 million frames of imagery from LANDSAT and other satellites, and 4.5 million NASA and other aircraft pictures.

The EROS Data Center provides users with reproductions of imagery not only from LANDSAT, but also from Skylab and the other manned satellites. The Center also supplies air photos taken by NASA and U.S. Geological Survey. The EROS Program provides training and assistance in the interpretation and use of LANDSAT data at the Users Assistance Facilities located at Sioux Falls, South Dakota; Bay St. Louis, Mississippi; Phoenix, Arizona; Denver, Colorado; Reston, Virginia; and the Canal Zone. Besides these areas, there are several Browse Files where the public may view microfilm of the imagery, including those in Boston, Massachusetts; Columbus, Ohio; and Washington, D.C. For further information contact: Charles F. Withington, EROS Program, 1925 Newton Square East, Reston, Virginia 22090, (703) 860-7871.

Geographic Information System

The Geographic Information System (GIS) provides the user with machine-readable data on land use, land cover, census tracts, drainage basins, political boundaries and Federal land ownership, at a scale of 1:250,000.

Computer programs are being developed to edit and correct the digitized map data; to convert the data from polygon to grid format; to complete land use statistics by counties, states, river basin and subbasins, census tracts and other geographic units; and to produce cartographic products for publication. For further information, contact: Dr. William B. Mitchell, Geographic Information System, U.S. Geological Survey, Department of the Interior, National Center, Mail Stop 710, Reston, Virginia 22092, (703) 860-7796.

National Cartographic Information Center

The National Cartographic Information Center (NCIC) was established in July 1974, using the former Map Information Office as a nucleus, in response to the growing need for a central information service to provide information on the availability of the large volumes of cartographic data produced by Federal and State agencies and the private sector. Since then, NCIC has increased its holdings to include some information about most Federal cartographic data. A major task now underway is to develop a data base for maps and charts. All of the NCIC data bases will make extensive use of microfilm and computer access.

NCIC cartographic information includes aerial and space imagery, maps, charts, geodetic data and related digital cartographic data produced by Federal agencies, selected State and local agencies and some private sources. Information about the status of ongoing cartographic data collection efforts is also available. When fully operational, NCIC will provide central ordering services for many of the products mentioned above. For further information, contact: John T. Wood, NCIC, U.S. Geological Survey, Department of the Interior, 507 National Center, Reston, Virginia 22092, (703) 860-6045.

National Water Data Exchange

The National Water Data Exchange (NAWDEX) has been established to assist users in locating and acquiring water data available from both Federal and non-Federal organizations. Assistance is available through the NAWDEX Program Office, located at the Geological Survey's National Center in Reston, Virginia, and through a nationwide network of Local Assistance Centers located in 45 states and Puerto Rico.

Two computerized data bases are maintained to help identify available water data. The "Water Data Sources Directory" identifies organizations and locations from which water data may be obtained and the types of data available. The Master Water Data Index identifies the location of individual sites for which water data are available and the types of available data. Information is currently obtainable on water data from over 300 organizations.

All water-oriented organizations are encouraged to become participating members of NAWDEX. MEmbership is voluntary and involves no financial commitment to the member. For further information, contact: Melvin D. Edwards, National Water Data Exchange Program Office, U.S. Geological Survey, Department of the Interior, 421 National Center, Reston, Virginia 22092, (703) 860-6031.

National Water Data Storage and Retrieval System

Water data stored in the National Water Data Storage and Retrieval System (WATSTORE) are available to users upon demand in either machine-readable form or hard copy (e.g., computer printouts, publications). Computer programs are also available to produce a variety of hydrologic analyses and tabular and graphic presentations of the data.

The U.S. Geological Survey, as the principal Federal water data collection agency, began collecting background information on the Nation's water resources before 1900. Over the years, data have been assembled from more than 160,000 sites throughout the United States. The Storage and Retrieval System contains more than 390,000 peak-flow observations; 400,000 station-years of daily streamflow values, water levels and water quality observations; and the results of over 1,200,000 chemical analyses. Currently, the system annually receives data from more than 10,000 stations, 1,300 lakes and reservoirs, 4,300 water-quality stations, 4,100 temperature-measurement sites, 880 sediment stations and 2,500 key wells. Additional data from many other sites are also added to the system as a result of approximately 1,500 water resources investigations currently in progress.

Work in 1976 involved implementation of new storage and retrieval capabilities for ground-water site inventory and water-level data. This new Ground-Water File will allow for the storage of large volumes of data relative to the physical, topographic, hydrologic and geologic characteristics of ground-water sites. The Ground-Water File currently contains site inventory information for 600,000 sites and water-level information from 10,000 wells. For further information, contact: Charles R. Showen, Water Resources Division, U.S. Geological Survey, Department of the Interior, National Center, Mail Stop 437, Reston, Virginia 22092, (703) 860-6879.

Outer Continental Shelf Geological and Geophysical Public Data

Certain types of geological and geophysical data are released to the Public Records Section or are available as Continental Shelf Geological and Geophysical Open-File Reports in the regional conservation managers' offices at Metairie, Louisiana; Menlo Park, California; and Washington, D.C. These data include well logs of holes drilled on all Outer Continental Shelf (OCS) Federal leases which have expired; nonproprietary information on all OCS Federal leases, including operator and well name, surface location and other material; and exclusive high resolution geophysical record sections and shot point or trackline maps on reproducible bases.

The Geological Survey has publicly available well logs on expired OCS leases since they began to expire and, as a matter of practice, has released seismic data that have been gathered exclusively for use by the Government. During 1974, approximately 13,800 line miles of nonproprietary high-resolution geophysical data from the Gulf of Mexico were released. During 1975 and 1976, high-resolution seismic data have been acquired and released for selected areas of offshore Alaska, southern California, the Atlantic Coast and the Gulf of Mexico. In 1977, at least 6,150 miles of high-resolution seismic data from the Georges Bank area of the Atlantic Ocean could be released through the National Oceanic and Atmospheric Administration.

The results of deep stratigraphic drilling, commonly referred to as Continental Offshore Stratigraphic Tests (COST), are released in open-file reports five years after the completion of the test or 60 days after the issuance of the first Federal lease within 50 miles of test site, whichever is earlier. The COST program is aimed at obtaining scientific data about the geology of the Outer Continental Shelf and its potential resources. Tests are drilled off-structure and are located to provide the best and most complete geologic and stratigraphic information. Participation is open to any interested party on a shared-cost basis, and the data from the tests are provided to the Government at no cost. For further information, contact: Russell G. Wayland, Conservation Division, U.S. Geological Survey, Department of the Interior, National Center, Mail Stop 600, Reston, Virginia 22092, (703) 860-7524.

Resources and Land Investigation Program

The Resources and Land Investigation (RALI) Program is a Departmental program initiated to help Federal,

State and local land use planners and managers make better use of natural resources information. The program is managed for the Department of the Interior by the Geological Survey. RALI sponsors the development of methodological guidebooks; supports research in methods of technology development and transfer; and supports information dissemination activities, such as preparation of thematic maps and other information products developed for use by planners and managers and the inventorying and cataloging of information and information dissemination systems and techniques. Primary emphasis has been on the development of methodological guidebooks, on topics such as designating critical environmental areas; listing and evaluating State land and resource inventory systems; assessing the environmental consequences of energy related actions; evaluating pipeline transmission and multi-use corridors; developing State programs for surface mining reclamation; and assessing onshore impacts related to OCS oil and gas development.

In 1976 RALI sponsored, in conjunction with the Council on Environmental Quality, the development of the National Environmental Statistical Report. Activities also were initiated in the development of a directory of information sources in the Department of the Interior and for the testing of an automated system using aerial photography and satellite imagery to develop timely information for the management of land resources. The former is in conjunction with the Department's Office of Library and Information Services and the latter with the Bureau of Indian Affairs. For further information, contact: Chief, RALI Program, U.S. Geological Survey, Department of the Interior, National Center, Mail Stop 750, Reston, Virginia 22092, (703) 860-6717.

DEPARTMENT OF JUSTICE

LAW ENFORCEMENT ASSISTANCE ADMINISTRATION

The Omnibus Crime Control and Safe Streets Act of 1968 (PL 90-351) and its amendments created the Law Enforcement Assistance Administration (LEAA) in the Department of Justice with the mission to provide grant law enforcement and criminal justice systems. Through State criminal justice planning agencies, LEAA supports hundreds of research and development programs in the areas of crime prevention, police operations, courts prosecution and corrections. In order to support this overall mission, LEAA has the responsibility to develop a national and international program for the collection and dissemination of information relating to innovations which upgrade and strengthen law enforcement and criminal justice.

Since 1972, the National Institute of Law Enforcement and Criminal Justice (the research center of LEAA) has supported the operation of the National Criminal Justice Reference Service (NCJRS) to meet these responsibilities. Offering a wide range of information services to the nation's law enforcement and criminal justice community, NCJRS is the first such Federal system in the field.

NCJRS PRODUCTS AND SERVICES

NCJRS provides referral action and information dissemination through the following services:

- selective notification of information
- reference and information services
- a document index
- loan documents
- current awareness materials
- annotated bibliographies
- public and academic packages
- nondocumentation
- NCJRS in-center services

Basic to the performance of the key NCJRS services is the data base--a broadly based, automated collection of references material covering all aspects of criminal justice. This collection includes LEAA research and development and action grant project reports and studies, as well as publications, books, journal articles, monographs, films, kits, slides and other media from a wide variety of Government and non-Government sources. NCJRS reviews documentation from foreign nations for pertinent data, as well as complete translations and translation summaries for inclusion in the data base. The data base generates output in the form of a bibliographic citation and informative abstract for most items in the system.

The data base of 26,000 entries is now increasing at the rate of 12,000 items annually. Users performed 7,500 searches in 1976.

The terminology in the *National Criminal Justice Thesaurus*, the authoritative file of controlled words and word combinations in the field of law enforcement and criminal justice, is the base for all indexing and retrieval of information.

SELECTIVE NOTIFICATION OF INFORMATION

Selective Notification of Information is an automated, selective information dissemination service designed to keep 44,000 registered users informed of developments in specific areas of interest. Approximately twice each month users receive abstracts of significant new publications, films and criminal justice activity announcements, together with an order card for those materials available from NCJRS. Registered users can obtain single copies of NCJRS documents free of charge simply by returning the order card. During 1976 users received over 750,000 of these documents. When documents are available from other sources, the abstract card contains ordering information, prices and addresses. While NCJRS normally provides services without charge, users referred to other sources must expect to pay the established charges of those sources.

REFERENCE AND INFORMATION SERVICES

Through its staff of referral specialists, the reference service offers its users personalized service in response to inquiries in the areas of police, courts, juvenile justice and corrections. Justice specialists answer queries received by mail, phone or in person and refer the investigator to the appropriate information source. Using computerized search techniques, the referral specialists call the NCJRS data base for relevant material, which is then forwarded to the inquirer. The materials may include complete LEAA documents or selected segments, bibliographic information, abstracts, bibliographies, reprints of articles, computer search printouts and referral information of other related sources. The references service accepts queries from both registered and general users.

DOCUMENT INDEX

The *Document Index*, issued four times a year, provides bibliographic information on documents in the NCJRS data base. These documents are available to the users either through NCJRS or from an outside source.

LOAN DOCUMENTS

NCJRS established the Loan Documents Program to allow users to borrow difficult-to-obtain documents for a limited period of time.

CURRENT AWARENESS MATERIALS

Current awareness materials are issued on an "as-required" basis and cover a wide variety of criminal justice information. Ranging from 1-page flyers to 20-page brochures, they describe major criminal justice information resources not covered by the other reference service products and services.

ANNOTATED BIBLIOGRAPHIES

NCJRS periodically issues annotated bibliographies on timely, specialized subjects. Criminal justice and law enforcement specialists base these bibliographies on the relevance, significance and nature of the information needs expressed through contacts with the user community.

PUBLIC AND ACADEMIC PACKAGES

Involved citizens and students receive special attention at NCJRS through information supplied by the public and academic packages. NCJRS specifically designed these packages to answer special inquiries from the non-professional user.

NONDOCUMENTATION

Many items acquired by NCJRS do not fulfill the stringent requirements needed to include them in the data base. This information, however, is valuable and is collected in special packages arranged by topic.

During the year, LEAA also funded the International Clearinghouse on Crime, Deviance and Social Control at the United Nation's Social Defense Research Institute in Rome, Italy. This clearinghouse, which is compatible with NCJRS, identifies foreign materials for the data base, provides abstracts of foreign information materials and produces selected bibliographies and translations for NCJRS users. For further information, contact: John L. Carney, Director, Reference and Dissemination Division, Office of Technology Transfer, National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, 633 Indiana Ave., N.W., Washington, D.C. 20531, (202) 376-3882.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT

The technical information activities which the Agency for International Development (AID) undertook during calendar year 1976 fall into three categories:

- those associated with Program Information and Analysis
- those recommended by the AID Library and Information Retrieval Task Force for the establishment of a Development Information Service
- those under the auspices of the Technical Assistance Bureau.

PROGRAM INFORMATION AND ANALYSIS

(1) Country Program Data Bank (CPDB)
(2) Economic and Social Data Bank (ESDB)
(3) Project Accounting Information System (PAIS)
(4) Project Performance Tracking (PPT)

The Country Program Data Bank will provide a readily accessible central source for planning and budgeting information on all AID activities and design information on all AID projects. CPDB will also facilitate the preparation of budget documents such as the Congressional presentation of the budget.

The Economic and Social Data Bank will provide a readily accessible central source of economic and social data and descriptive material at country level on a worldwide basis where data is available, concentrating on lesser developed countries. ESDB will also support data needs for numerous AID documents and reports and for responses to Congressional and public queries. It will also permit economic modeling.

The Project Accounting Information System will provide financial data of AID project activities for use in monitoring financial progress (I.e., planned versus actual) and in discharging AID's financial-management responsibilities.

The Project Performance Tracking System will provide an optional system for the tracking of physical progress in the implementation of AID-funded activities and projects. PPT will contain information on the Critical Performance Indicators (CPI's) of AID projects and the monitoring of actions relating to those CPI's during the implementation of the project. For further information on CPDB, ESDB and PPT, contact: G. T. Bliss, Director, Program Information and Analysis Services, Agency for International Development, Washington, D.C. 20523, (703) 235-8420. For information on PAIS, contact: T. R. Blacka, Controller, Agency for International Development, Washington, D.C. 20523, (202) 632-0128.

DEVELOPMENT INFORMATION SERVICE

Pursuant to recommendations by an AID task force on Library and Information Retrieval, AID is establishing a Development Information Service (DIS) assigned to provide information required by project designers. Its purpose is to improve the quality of AID's project design and evaluation system. DIS will integrate many existing information activities and will include an information processing, storage and retrieval system; it will utilize information on AID's own experience in development and will also draw on the state-of-the-art in technical areas, relying on information systems and data banks external to AID (e.g., the UN Agencies, academic institutions, research centers).

The present AID Reference Center is a repository for documentation of AID project activities and is to be incorporated into DIS. Abstracts of AID documents will be entered into the DIS data base. For further information, contact: M. D. Brown, Director, PPC/DIS, Agency for International Development, Washington, D.C. 20523, (703) 235-9207.

TECHNICAL ASSISTANCE BUREAU

The Technical Assistance Bureau's information management system has been designed to serve as the connecting link between AID-sponsored research centers (primarily in the United States) which produce information of a specialized nature and Third World institutions which need this information for development projects. The system insures that research and development publications are collected from TAB contractors and grantees, and that they are analyzed and cataloged as a basis for subsequent retrieval. The system also provides for permanent storage of documents in microfiche form, from which copies may be readily produced for AID staff personnel and for national and international organizations involved in development.

The system includes the following functions and services:

- Acquisition of research and development materials and their analysis, which is essential for inputting into an automated data base
- Production of a master microfiche of all research and development titles in the data base for document delivery and for microfiche deposit collections in key international centers
- Announcement of a quarterly journal of abstracts and recently completed studies and publications, and Volume 1 of a catalog printed from the data base containing research and development titles produced through TAB-sponsored research activities between 1962 and 1976 (issued in January

1977). The announcement would be directed especially to research and education-extension units in the developing world, national-level offices concerned with planning and utilization, AID personnel and national and international agencies involved in development

- Publication of periodic reports and directories which summarize research and development activities and resources (e.g., the *Directory of Institutional Resources* identifies and describes resources and services developed under 211(d) grants)

- Identification and assessment of the capability of key international centers to share in TAB information resources and to serve, through networking, as relay points within developing countries and regions

- A computerized mailing list (ADDS) containing more than 5,500 institutions in the developing world, selected American universities, international organizations and AID addresses. Other AID offices may add specialized mailing lists to ADDS

- A distribution center which, during 1976, mailed approximately 20,000 microfiche/paper copies of research and development materials to AID personnel and to individuals, organizations and government agencies in the Third World countries.

For further information, contact: J. L. Hafenrichter, Agency for International Development, Washington, D.C. 20523, (703) 235-8936.

DEPARTMENT OF TRANSPORTATION

The Department of Transportation (DOT) was established for the purpose of developing national transportation policies and programs to provide fast, safe, efficient and convenient transportation at the lowest possible cost. The Department promotes and undertakes development, collection and dissemination of technological, statistical and economic information, in addition to consulting and cooperating with State and local governments.

The generation, processing, dissemination and management of information continued to receive close attention during 1976. Advances occurred in such areas as the following:

- reassessment of DOT policies concerning documentation and distribution of information which is derived from DOT research and development and other study efforts
- implementation of advanced research and development management information services
- institutionalization of the national network of transportation research information services
- improvements in the availability of statistical information for policy, regulatory and investment decisions
- mechanisms and efforts for sharing of information on experience, options, techniques and technologies between and among the various elements of the U.S. transportation community.

COLLECTION AND ACCESSIBILITY TO NUMERICAL/STATISTICAL DATA AND INFORMATION

One of the more difficult and complex problems resides in the area of numerical data. At present there are numerous statistics that tell much about the individual modal systems (rail, air, etc.) but there is a scarcity of information regarding the intermodal relationships. Little information is available concerning transportation choices that business and individuals make and the impacts occurring as a result of changes in the national regulatory or investment policies. Characteristic data problems may include the absence of appropriate data sets to support policy analyses, incompatible definition of data items in the existing data bases, restrictions on disclosure (confidentiality of collected data), inadequate sampling, users' unawareness of data sources, cumbersome and time consuming access methods, among many others.

In 1976, however, the Department attempted once more to solve some of these data problems. A Departmental Data and Methodology Coordinating Committee was established to facilitate the development of an adequate data base and methodologies useful in the evaluation of Federal transportation policy and programs. The committee action plan includes re-examination of the data requirements, identification of the current data gaps and problems, as well as recommendations to the Secretary on future data programs and policies.

INFORMATION FOR MANAGERS OF RESEARCH AND DEVELOPMENT PROGRAMS

DOT research and development activities represent an annual expenditure of approximately 400 million, distributed over more than 500 programs. In turn, these programs are executed through some 2,000 contracts and in-house projects. The bulk of transportation research and development is sponsored and monitored by seven modal administrations* each making sure that research and development activities are relevant to their missions, such as air traffic control, harbor services, improvement of public transit and the like. The Assistant Secretary for Systems Development and Technology monitors all these programs and also sponsors and directly administers transmodal research, i.e., research applicable to more than one mode of transport such as tunneling and energy conservation. Additionally, he serves as a departmental point of contact for the external reporting on research and development activities and for coordination of DOT research plans and programs with other agencies. These other agencies (e.g., ERDA, EPA, DOD, NSF) sponsor more than 6,000 research and development projects that contribute to the improvements of U.S. transportation systems.

The need of the research and development managers to be informed about all these programs has led to the experimentation with new forms of management information systems which incorporate fiscal, programmatic and milestone data. In 1976, DOT completed the experimentation and demonstrations of a computer-based system called Transportation Research Activities Information System (TRAIS). The resulting operating system incorporates information on program proposals, research and development budget submissions and ongoing programs and projects. Each item contains textual as well as numerical data. The system includes all DOT-funded research and in the area of annual budgets. all DOT-funded efforts, such as block grants to states and subsidies to operational transportation systems. The system outputs consist of periodic management reports on the status of programs, annual analyses of DOT Programs and their distributions by management objective. Other management categories used by the Secretarial offices assess the comprehensiveness, direction and cost/benefits derived from DOT research and development expenditures. The system constitutes a backbone for most of the external reporting to the

*Federal Aviation Administration, Federal Railroad Administration, Federal Highway Administration, National Highway Traffic Safety Administration, United States Coast Guard, Urban Mass Transportation Administration, St. Lawrence Seaway Development Corporation.

Congress, to other Federal agencies and to the technical community on the scope, substance and outputs of DOT RD&D. This external reporting includes the submission of all DOT notices of research to the Smithsonian Science Information Exchange (SSIE) and announcements of research funds to the National Science Foundation's Annual Survey of Federal funds for research and development and other scientific activities.

NETWORKING AMONG TRANSPORTATION LIBRARIES AND RESEARCH INFORMATION SYSTEMS

During 1976, the Transportation Research Information Services Network (TRISNET) wielded Government and private information and library services into a comprehensive system. Prior to the institutionalization of TRISNET as a formal operating system, most of the efforts were directed to top-level policy and funding decisions. Extensive studies focused on such questions as the methods for operating common computer and document delivery facilities, the opportunities for insuring an equitable exchange of information with other countries, the network coordinating mechanisms, financing TRISNET operations and user service charge policies.

Operationally, the various elements of the network continued to improve in the scope, quantity and quality of services. The data base of abstracted or cataloged reference materials (documents, books, reports and summaries of ongoing research) which deal directly with transportation problems or technologies has reached a level of 500,000 documents. The on-line accessible data base of transportation abstracts has also grown during 1976 from 40,000 selected items to more than 70,000. This data base, known as TRIS-ON-LINE, is currently operational at the Battelle Columbus Laboratories under contract with DOT. Under the terms of the contract, Battelle maintains the data base, provides retrieval software (BASIS), trains terminal operators and demonstrates the system at transportation-related conferences and seminars. Users of BASIS have conducted 5,000 searches through the sixty terminals of the network in 1976.

PUBLICATION AND DISTRIBUTION OF RESEARCH AND DEVELOPMENT OUTPUTS

The documentation procedures for the information resulting from the Department-wide research, development and demonstration (RD&D) programs have been thoroughly reviewed to ensure that they are consistent with the intent of the national transportation policy (as detailed in a Statement of National Transportation Policy by the Secretary of Transportation, Washington, D.C., September 15, 1975), as well as with the expressed requirements of the planners and technologists in the U.S. transportation community. The review disclosed several areas needing improvement, especially the handling of computerized products such as analytical and decision models which are intended for use by local and regional transportation planning bodies. Shortcomings were also found in the documentation of statistical and other numerical data bases. The findings of the review are being incorporated in a unified Department-wide directive (DOT order 1700.18) which will be republished in 1977. The revision will furnish standardized descriptions and cataloging data that must accompany all documentation when it is distributed to transportation-oriented libraries and information centers. Additionally, the current documentation and distribution procedures used in scientific and technical reports will be extended to apply to all socioeconomic and transportation policy-related studies and other reports which are intended for public use.

TECHNOLOGY SHARING AND UTILIZATION

With a steady decline in transit and rail patronage and increasing operating deficits, the sharing of experiences, options and technologies capable of improving urban and rail transportation has taken on added importance in the planning and execution of DOT scientific and technical information activities. DOT has directed its attention to such ideas as integrated transit, and major city interests have reflected these ideas through the use of "paratransit" systems. These systems, which include taxis, pitneys, flexible route or dial-a-ride buses, can provide new and broader classes of service over the urban region, particularly in the low density areas.

Faced with an increasingly complex set of options to consider and requirements to meet, State and local governments found greater need for access to the latest technological and socioeconomic information produced by Federal and other RD&D efforts. Recognizing that simple reporting of research results in technical reports is insufficient to assure assimilation of new technologies, DOT continued to experiment with a variety of transfer mechanisms. Of these, the mechanisms which permitted direct consultation were found to be the most effective. Tailored documents and seminars, videotape recordings and on-request response services were next on the list of cost-effective methods for imparting relevant knowledge to the State and local planners and decision-makers.

In 1976, the tempo of the technology sharing activity was accelerated, and the Transportation Systems Center handled more than 5,000 requests for technical assistance from State and local transportation organizations. Collectively, DOT research and development offices sponsored over 50 conferences, workshops and seminars to acquaint the potential technology users with advances in urban transit planning and traffic management techniques, transportation for rural areas, effective design of transportation structure, energy conservation and other areas of concern. Technical and financial support was also given to a variety of regional and local information transfer organizations such as the Urban Consortium and Model Interstate Scientific and Technical Clearinghouse (MSTIC). All modal administrations continued the publication of special purpose information packages on a wide variety of subjects to insure that the results of research and development were presented in a manner which facilitated their comprehension and use by the planners of the national transportation community. For more information, contact: Dr. Alexander Hoshovsky, Research and Development Information Officer, Department of Transportation, 400 7th Street, N.W., Washington, D.C. 20590, (202) 426-0975.

ENERGY RESEARCH AND DEVELOPMENT ADMINISTRATION

The President signed the Energy Reorganization Act of 1974 into law on October 11, 1974. One effect of this act was the incorporation of non-regulatory activities of the Atomic Energy Commission (AEC) into a new Energy Research and Development Administration (ERDA) and the inclusion of atomic regulatory activities into the Nuclear Regulatory Commission (NRC). ERDA has a broad charter to develop new and improved energy source and utilization technologies consistent with sound environmental and safety practices. Such technologies cover all forms of energy sources including fossil, nuclear, solar, geothermal and others, as well as conservation research and development.

ERDA establishes and administers such programs as supply of uranium concentrates and other raw materials; production and management of fissionable materials; development, manufacture and testing of nuclear weapons and related ordinance devices and systems; development of nuclear reactors for civilian, military and space use, including the conduct of safety research programs; the development of the Nation's first liquid metal fast breeder reactor, fusion reactors and non-nuclear energy technologies. Other programs include basic and applied research and development in biological, medical, physical, environmental and engineerring sciences; development and application of systems to detect and prevent the loss or diversion of nuclear materials; dissemination of information related to atomic energy; development and administration of arrangements for international cooperation in peaceful uses of atomic energy; and sponsorship of special purpose training in the interest of development of atomic energy uses.

OFFICE OF ENVIRONMENTAL INFORMATION SYSTEMS

The Office of Environmental Information Systems initiated the National Energy-and-Environment Data System (NEEDS) to analyze, integrate and improve dissemination of information supporting the enhancement of the U.S. position on energy.

A major component is the National Catalog of Data Bases and Models, listing approximately 4,000 data bases and 4,000 models related to energy and the environment. Available on-line, this catalog would be useful to Federal, State and local agencies in projecting energy and environmental impacts.

The Socioeconomic, Environmental, and Demographic Information System (SEEDIS) at the Lawrence Berkeley Laboratory and the Regional and Urban Studies Information Center (RUSTIC) at the Oak Ridge National Laboratory are data base and analytical systems for presenting the socioeconomic effects of increased energy production. These centers provide assistance ranging from supplying census, labor and county data with advice on how to use it, to comprehensive analytical and mapping services.

The Information Center Complex (ICC) at the Oak Ridge National Laboratory serves as a multi-agency coordination center for bibliographic data in the biomedical and environmental areas. Agencies joining ERDA in support of ICC include the Environmental Protection Agency; the Department of Health, Education, and Welfare; and the National Science Foundation. One of its component centers, the Environmental Mutagen Information Center, compiles data on chemicals having mutagenic effects.

The Information Center for Energy Safety operates as a national center for collecting, storing, evaluating and disseminating safety information essential to the development and use of non-nuclear forms of energy. Specifically, this center is uniquely concerned with safety considerations and relevant standards useful in the design, construction and operation of the various energy systems and their supportive research facilities.

The Interlaboratory Working Group on Data Exchange responded to an evident need for sharing resources among ERDA installations. During 1976, principal accomplishments focused on the interlaboratory exchange of data bases and on the initial implementation of a computer-independent standard for exchange of data via magnetic tape. This standard is available to all Federal agencies for more cost-effective exchange of data.

Two inventories of energy-related research were published and established as searchable data bases for use in national energy planning. The *Inventory of Energy Research and Development: 1973-1975* was prepared and issued for the Committee of Science and Technology, U.S. House of Representatives. It includes over 8,000 research and development projects underway in Federal, State and regional organizations, universities, industry and nonprofit groups. The *Federal Inventory of Energy Related Biomedical and Environmental Research for FY 1974 and FY 1975* covers all Federal agencies, analyzing their programs and providing a mechanism for coordinating programs in this area. For further information on the above plus other areas of effort (land use, ecology, etc.) contact: Theodore M. Albert, Director, Office of Environmental Information Systems, Energy Research and Development Administration, Washington, D.C. 20545, (301) 353-3311.

REORGANIZATION OF ERDA SCIENTIFIC AND TECHNICAL INFORMATION (STI) FUNCTIONS

Effective July 1, 1976, the STI functions of the ERDA Office of Public Affairs (OPA) were transferred to

a new component called the Office of Technical Information (TI) under the Assistant Administrator for Institutional Relations. This office consists of the Systems Development Branch, the Science Services Branch, the Technology Information Branch, the Special Assistant for Conferences located at ERDA Headquarters and the Technical Information Center (TIC) at Oak Ridge, Tennessee.

ENERGY INFORMATION DATA BASE

During 1976, EEDB (ERDA's Energy Information Data Base) was expanded to provide computerized bibliographic coverage of the technical literature in all fields of energy research and development. The expansion of EEDB was based on the following guidelines:

- To develop a system designed primarily to meet the research and development needs of ERDA
- To build this system by making maximum use of information already available in the United States and abroad and acquiring this information by purchase or exchange
- To seek the assistance, as appropriate, of the private sector in acquiring information to meet ERDA's specific needs.

With the discontinued publication of *Nuclear Science Abstracts* on June 30, 1976, EEDB experienced a major expansion in subject scope, namely, the inclusion of nuclear information. Foreign nuclear input to the EEDB was accomplished through the use of magnetic tape versions of *Atomindex*, prepared by the International Nuclear Information System (INIS) of the International Atomic Energy Agency (IAEA) located in Vienna, Austria.

The annual EEDB input grew from 100,000 in 1975 to 140,000 citations in 1976. Whereas increases were experienced in all subject categories, major increases occurred in areas related to coal, petroleum, nuclear power and solar energy. The total EEDB subject scope is described in TID-4584, "ERDA Energy Information Data Base - Subject Categories", available from the Technical Information Center, P. O. Box 62, Oak Ridge, Tennessee 37830. A subject category breakdown of its content as of the end of 1976 appears as follows:

SUBJECT BREAKDOWN OF ERDA'S ENERGY INFORMATION DATA BASE (EEDB)

Subject Categories	Citations
- Coal and Coal Products	17,942
- Petroleum	4,836
- Natural Gas	2,332
- Oil Shales and Tar Sands	3,472
- Fission Fuels	29,884
- Isotope and Radiation Source Technology	9,415
- Hydrogen	5,362
- Other Synthetic and Natural Fuels	2,639
- Hydro Energy	524
- Solar Energy	12,197
- Geothermal Energy	6,293
- Tidal Power	218
- Wind Energy	599
- Electric Power Engineering	6,295
- Nuclear Power Plants	84,937
- Nuclear Reactor Technology	46,509
- Energy Storage	4,873
- Energy Policy	9,771
- Energy Conversion	11,603
- Energy Conservation, Consumption & Utilization	3,802
- Advanced Automotive, Propulsion Systems	2,599
- Materials	76,057
- Chemistry	86,131
- Engineering	26,538
- Particle Accelerators	18,401
- Instrumentation	48,476
- Explosions and Explosives	9,307
- Environmental Sciences	27,210
- Biomedical Sciences	107,593
- Physics Research	292,318
- Controlled Thermonuclear Research	40,648
- General and Miscellaneous	10,239
- Geosciences	535
1976 Total	1,009,546

ERDA/RECON

Further development and expansion of ERDA/RECON, an on-line interactive information retrieval system, continued. By the end of 1976, approximately 120 terminals spanning the 48 contiguous states had access to the system.

In addition to the ERDA-prepared data bases, 12 additional data bases were available on RECON. The following is a list of the bases and their use statistics for 1976:

ERDA/RECON DATA BASE ACTIVITY FOR 1976

Data Base	Sessions	Citations
(TIC) Nuclear Science Abstracts	16,948	772,652
(EISO) Toxic Materials Data Base	181	2,491
(CAS) Chemical Abstracts/Energy	561	964
(WRSIC) Water Resources Abstracts	3,609	318,528
(NDP) Nuclear Structure Reference	313	7,624
(EMIC) Env Mutagens Information	405	17,270
(TIC/CSD) ERDA Energy Data Base	8,107	316,252
(EISO) Energy Research & Development Projects	827	22,589
(ESIC) Env. Science Index	335	12,480
(CSD) Engineering Index	1,893	32,491
(NSIC) Nuclear Safety Information Center	1,857	150,226
(CSD) Metals Abstracts (Metadex)	952	14,147
(LC) National Referral Center	411	1,434
(EIC) Env. Sci. Referral File	22	8

TIC prepared and distributed TID-4586, "ERDA/RECON User's Manual", in looseleaf form. This guide is continuously updated to reflect changes in both system operation and data base availability and covers basic and detailed instructions for system users.

INTERNATIONAL PROGRAMS

ERDA continued to participate in the International Nuclear Information System (INIS), coordinated by the International Atomic Energy Agency located in Vienna, Austria. INIS now provides bibliographic coverage of the nuclear science and engineering literature generated in 48 contributing countries, as well as by 12 international organizations. The U.S. input, provided by ERDA, included 22,715 items, or 38 percent. IAEA processed and merged all contributed data and issued the following three products:

- a magnetic tape containing abstracts and index terms issued semimonthly
- *INIS Atomindex*, printed semimonthly, complete with indexes and abstracts
- full text of nonconventional literature (also in microfiche form).

ERDA continued to explore the feasibility of bilateral information exchange arrangements with foreign governments in both the nuclear and non-nuclear fields.

INTERAGENCY COOPERATION

During the year, other Federal agencies with energy interests were granted access to ERDA/RECON to meet some of their information retrieval requirements. In turn, these agencies made available to ERDA their data bases which are of interest to ERDA's programs.

In 1976, ERDA continued its participation in the Government/Industry Data Exchange Program (GIDEP). GIDEP is funded by the participating Federal agencies and managed by the Naval Material Command. For a further description of GIDEP, see Department of Navy.

ERDA signed interagency agreements concerning information services and products with the Environmental Protection Agency, the Federal Energy Administration, the Department of Agriculture Forest Service and the Department of the Interior.

PUBLICATIONS PROGRAM

Nuclear Science Abstracts, which began publication in July 1948, was discontinued at the end of June 1976. More than 947,000 items covering all areas of nuclear science had been abstracted and indexed at the time of its termination. *ERDA Energy Research Abstracts* had its first full year of monthly abstracting and indexing coverage of all ERDA-originated scientific and technical reports, journal articles, conference papers and proceedings, books, patents, theses and monographs. The first volume contained 26,932 citations with abstracts and indexes.

Other ERDA abstract publications are as follows:

- *Energy Abstracts for Policy Analysis.* This monthly abstracting and indexing journal announces selected publicly available information related to energy policy, management, legislation and socioeconomics.

- *Solar Energy Update.* All solar energy-related information processed into the EEDB is announced in this monthly abstracting and indexing journal.

- *Fossil Energy Update.* This monthly abstracting and indexing journal announces all current fossil energy-related information processed into the EEDB.

- *Geothermal Energy Update.* This quarterly abstracting and indexing journal announces all geothermal energy-related information processed into the EEDB.

Other publications included extensive bibliographies on Radioactive Waste Processing and Disposal, Geothermal Energy, Coal Processing, Production and Properties, Liquid Metal Fast Breeder Reactors, Nuclear Medicine, and Controlled Fusion and Plasma Research.

A series of bibliographic aids are published for use with the EEDB. Available in the series are, as follows:

ERDA Energy Information Data Base - Subject Thesaurus (TID-7000)

ERDA Energy Information Data Base - Corporate Author Entires (TID-4583 and TID-4585)

ERDA Energy Information Data Base - Magnetic Tape Descriptions (TID-4581)

ERDA Energy Information Data Base - Serial Titles (TID-4579)

ERDA Energy Information Data Base - Subject Categories (TID-4584)

Work done for other agencies include the following:

- *Power Reactor Docket Information.* Prepared for the Nuclear Regulatory Commission (NRC) by ERDA, this monthly publication announced all docket information related to nuclear power plant licensing, regulation and operation.

TECHNOLOGY INFORMATION DISSEMINATION

Primary efforts were directed to the development and active dissemination of information products dealing with new technologies having near term market potential in the area of energy conservation. Publications included *Energy Efficiency Research, Industrial International Data Base: The Cement Industry, Total Energy Management for Hospitals* and *Total Energy Management for Nursing Homes* (the latter two in cooperation with HEW, DOC and VA).

Work was begun on the following reports which will be published in 1977: *Evaporation: A Prime Target for Energy Conservation* (executive briefing report); *Upgrading Existing Evaporators* (technical applications manual for process engineers) and the Efficient Operation of Slot Forging Furnaces (a manual).

CONFERENCES

During 1976, the Office of Technical Information (OTI) coordinated ERDA's financial support of 26 selected scientific and technical conferences. OTI also coordinated the U.S. participation in 12 international conferences involving arrangements with the Department of State for 475 official nominations of participants. Each of these conferences resulted in a publication of proceedings which was added to the Energy Data Base. For further information on the above, contact: Tom O'Leary, Office of Technical Information, Energy Research and Development Administration, Washington, D.C. 20545, (301) 353-4196.

ENVIRONMENTAL PROTECTION AGENCY

The Environmental Protection Agency (EPA) was established by the Reorganization Plan of 1970. EPA permits coordinated and effective governmental action to assure the protection of the environment by abating and controlling pollution on a systemic basis. Among other activities, EPA conducts environmental research, monitors pollution levels and enforces environmental protection standards. Its goal is to develop a properly integrated routine which will treat the environment as a single interrelated system.

AIR POLLUTION TECHNICAL INFORMATION

The technical information activities on air pollution are located at Research Triangle Park, North Carolina 27711.

EPA sponsors literature searching by computer, including retrospective retrieval from the Air Pollution Technical Information Center (APTIC) on-line file of 82,500 abstracts. EPA sponsorship also includes an inquiry/referral service regarding the identity and availability of particular agency publications dealing with air pollution.

Throughout 1976, management plans were extensively implemented. In response to personnel cuts, the EPA Office of Air Quality Planning and Standards freed personnel for work of higher priority elsewhere in the Office by procuring the needed effort from outside sources. Plans also called for the avoidance of selecting information from any serial publications which other on-line files might include. During 1976, contracts were modified and awarded for these purposes. As a result, the APTIC file became accessible through Lockheed's information service and is being updated at a new rate of 300 abstracts per month. Services which were discontinued include the following: the monthly "Air Pollution Abstracts"; the quarterly catalog "Air Pollution Technical Publication of the U.S. Environmental Protection Agency"; the monthly current awareness service; free literature searching for some requestors; assurance of accessibility of all documents abstracted in the APTIC file at each of EPA's ten Regional Offices; and bibliographies for photocomposition and publication. For further information, contact: Peter Halpin, Air Pollution Technical Information Coordinator, Environmental Protection Agency, Research Triangle Park, North Carolina 27711, (919) 541-2460, or for FTS, 629-2460.

LIBRARY SYSTEMS BRANCH

During 1976, the Library Systems Branch participated in the Bibliographic Systems study designed to pull together the various retrieval systems in the Agency in a common bibliographic format and software.

As a part of the State and Local Government program, Region V's Library is taking the lead in the development of a Region V journal holdings list for environmental libraries in the area. Assistance for the establishment of environmental libraries was provided in several states.

The 1976 training program for librarians emphasized communications with managers and users (public relations).

Under contractual agreements, a user education program for State and local legislators was produced, and the contract for development of a modal microform center was completed.

Interagency agreements with the State Department and NTIS are continuing. The joint journal holdings list for NOAA, U.S. Patent Office and EPA libraries was issued. Also, an agreement with NOAA has permitted sharing of data base access, issuance of a State and Local Environmental Library Directory and numerous other joint projects. An inter-agency agreement with the Federal Library Committee permitted EPA to share in studies of networking and minicomputers with other Federal Libraries, and to take advantage of the Library of Congress' contract with Bibliographic Retrieval Services.

The National Focal Point of the United Nations Environment Program's (UNEP) International Referral Service carried out the first UNEP Focal Point manager's training program for participants from Jamaica, Israel and Ghana. The Focal Point's operation manual and user's guides were issued, and 600 sources for the International directory were identified and submitted to UNEP. For further information, contact: Ms. Sarah Thomas Kadec, Chief, Library Systems Branch, U.S. Environmental Protection Agency, Room 2903, Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460, (202) 755-0353.

THE ONAC NOISE INFORMATION SYSTEM

The Office of Noise Abatement and Control (ONAC) maintains its own technical information storage and retrieval facility called Noise Information System (NIS). Information is input to this system from ONAC Staff, other EPA offices and ONAC's contractors, one of whom routinely surveys world literature in areas relevant to the requirements defined in the Noise Control Act of 1972 (PL 92-574). Citations are stored in computer files, and access through system indexes is available by means of an on-line interface with the computer.

Contractor personnel assist in accessing the stored data, retrieving hardcopy, maintaining circulation control of all incoming documents, interpreting and rationalizing information and acquiring hardcopy new source documents on a priority basis. Proper handling, maintenance, confidentiality

and circulation of information is assured by adhering to specified procedures.

The information bank now contains over 26,000 documents; approximately 2,000 new citations are added each month.

The Existing System

The Noise Information System consists of a number of stand-alone modules. The focal point of the system is a computerized user terminal oriented data base utilizing NASA's STIMS/RECON software package. A Technical Reference Center provides a human interface with internal ONAC information resources and a point of contact with other systems libraries, organizations and individuals.

Each module has responsibility for a different information function. The Technical Reference Center is responsible for referral service, periodical routing, research assistance, user assistance and access to external information resources. Technical Files maintenance includes hardcopy retrieval, file security and circulation control. The Acquisitions module acquires documents for ONAC staff and screens world literature for information related to ONAC Standards and Regulations requirements. Document Processing is responsible for receipt processing of materials, coding and indexing, editorial control, data entry and vocabulary control functions. Data Processing Services involve system design, maintenance and user training.

Publications

The most widely used guide to the ONAC Noise Information System is the biweekly *Shared Acquisitions List* (SAL). SAL covers all information generated or received by ONAC including published and unpublished reports, journal articles, correspondence and other forms of communication. All professional ONAC staff and authorized users may receive copies of SAL.

Other information announcement services include "Soundings", a monthly current awareness bulletin on noise, prepared from newspaper clippings from around the country.

System Access

Access to NIS is available to all ONAC staff and to authorized users. For more information concerning ONAC, contact Mr. Henry E. Thomas, Director, Standards and Regulations Division, Office of Noise Abatement and Control (AW-471), Environmental Protection Agency, Washington, D.C. 20460, (703) 557-7743.

PESTICIDE INFORMATION CENTER

The Pesticide Information Center (PIC) is part of the Information Branch of the Technical Services Division (TSD) of the Office of Pesticide Programs (OPP). There are four functional areas within PIC--Compendium of Registered Pesticides, Federal Register Activities, Pesticide Registration Data and Publications and Technical Literature Research Section (PTLRS).

Compendium of Registered Pesticides

The *Compendium of Registered Pesticides* has been superseded by a more comprehensive document called the *EPA Index of Pesticide Chemicals: Their Uses and Limitations* which will form an integral part of the registration standard. This document will include validated use patterns, dosages, application criteria, rates, frequency, tolerances, restrictions and limitation data for all active ingredient chemicals. During the preparation of the *Index*, no new data will be published. When it is completed, the document, or parts thereof, will be available to external users in the form of microfiche or loose-leaf hardcopy. For further information, contact: Phyllis Johnson, Chief, Scientific Support Section, Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460, (202) 426-2447.

Federal Register Activities

The *Federal Register* is the major current awareness publication for noteworthy matters concerning the daily operations of the executive branch of the Federal Government. OPP submits material on a daily basis for publication in the Register. This material includes any regulation, order, certificate or similar instrument on the subject of pesticides issued, prescribed or promulgated by EPA and developed within OPP. Material is published in the public interest or as required by statute. TSD provides the editorial and liaison functions as a part of its information program.

The Federal Register Section also maintains a file of any public comments resulting from the solicitation of views via a *Federal Register* document. These comments are available for public inspection under the Freedom of Information Act. For further information, contact: Chief, Federal Register Section, Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460, (202) 755-4854

Pesticide Registration Data

Several types of data are gathered during the process of pesticide registration. The data are committed to manual and automated inventories to support registration and other activities, both within and external to the Pesticide Program. These data include a technical profile of the pesticide products, use pattern (site/pest), use limitations and precautionary information and technical data submitted by the registrant in support of the registration/amendment request.

Much of this data is obtained from the product label. The balance is supplied in other forms by the registrant or generated in the registration process itself. An automated inventory system, Pesticide Product Information System (PPIS), for label and certain other data, is being enlarged to support various search, process control and reporting requirements, using hardcopy and computer output microform (COM) outputs. A set of product indexes that provide access to all registered products by chemical, site or pest, is being produced by PPIS via COM. These microfiche indexes are distributed to EPA regional personnel and to State extension and regulatory personnel through the U.S. Department of Agriculture and they are available to the public through NTIS. Data submitted in support of registration is classified,

accessioned and archived in a large storage facility and will be retrieved through computer searches of the label, company data and accession files. For further information, contact: Charles Colledge, Chief, Information Coordination Section, Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460, (202) 426-8850.

Technical Literature

The Publications and Technical Literature Research Section (PTLRS) provides literature searches, prepares bibliographies and supplies abstracts or full text copies, primarily in support of the Office of Pesticide Programs. PTLRS is also the focal point for the handling of reference books, periodicals and articles that are specific to pesticides. Holdings consist of about 1,000 textbooks, manuals and proceedings. Subscriptions to approximately 100 journals containing approximately 60% of the total pesticide literature are maintained, as is an in-house collection of articles on pesticides.

PTLRS maintains a contract under which the world's literature is scanned by the contractor for articles pertinent to its collection. Selected are abstracted and 250 references are published in *Pesticides Abstracts* (PESTAB) monthly. These are added to the collection as the hardcopy is received. These articles, collected since the early 1950's, currently number approximately 30,000 and represent one of the more comprehensive collections concerning pesticide toxicology and health effects.

The collection was originally cataloged in a manual card file. Recently, a computer-based catalog was developed and 30,000 citations have been converted to this system. Articles are classified on the basis of concept and compound and are microfilmed. Indexes with arrangement by author and by classification number as produced on computer output microform. These indexes, which provide access by compound, concept, or author, will provide sufficient specificity to replace on-line searches in many cases. For further information, contact: Paul Fuschini, Chief, Publications and Technical Literature Research Section, Environmental Protection Agency, 401 M Street, S.W., Washington, D.C. 20460, (202) 426-2432.

SOLID WASTE INFORMATION RETRIEVAL SYSTEM

The Solid Waste Information Retrieval System (SWIRS) of EPA is managed via the governmental contract mechanism. The SWIRS data base dates back to 1964 and covers the world's available literature including patent information; periodical and nonperiodical, State, local and National reports (where available); monographs; and conference proceedings. The system is now being converted from Optimum Systems, Inc. in Rockville, Maryland to RECON IV/STIMS IV at COMNET located in Washington, D.C. This conversion has resulted in a substantial cost reduction of automated data processing funds for the next year's operation. In addition, the SWIRS will finally be utilizing standardized computer programs for its day-to-day operations. These changes will enhance the quality of output due to the sophistication of search procedures.

SWIRS offers literature searches via computer, including the retrospective retrieval from the master file of more than 42,000 abstracts. It also supplies current awareness for in-house personnel via limited selective dissemination of information from various journals and announcement publications which are screened by the Chief of the Information Retrieval Services. An abstract bulletin, *Solid Waste Abstracts*, is produced monthly with subject and author indexes. SWIRS maintains an inquiry referral service regarding the identity and availability of particular technical publications dealing with Solid Waste Management as well as a solid waste library with inter-library loan services. All requests for literature searches, however, should be addressed to SWIRS, P. O. Box 2365, Rockville, Maryland 20852.

During calendar year 1976, there were approximately 6,000 new abstracts and documents entered into the master file and library. Papers describing the SWIRS activities were presented to the American Society of Civil Engineers and the American Society of Mechanical Engineers at their request during the year. These presentations resulted in increased utilization of the information bank. For further information, contact: John A. Connolly, Chief of the Information Retrieval Services, 401 M Street, S.W., Washington, D.C. 20460, (202) 755-9153.

TECHNICAL INFORMATION PROGRAM

The Technical Information Program within EPA's Office of Research and Development (ORD) was established in June 1975 to provide centralized management, coordination and implementation across the entire spectrum of information activities. Major activities include technical and scientific publications, response to inquiries from sources both internal and external to the Agency, Freedom of Information Act compliance, technical information support services and the EPA Technology Transfer Program. Primary emphasis, however, is placed on an aggressive program of active information dissemination to environmental decision officials and other important user groups, both within and external to the Agency. The major accomplishments of calendar year 1976 include consolidation of all technical information activities at the newly created Environmental Research Information Center, Cincinnati, Ohio; publication of 520 Scientific and Technical reports; responses to 7,300 information inquiries; publication of quarterly Bibliographic Summaries and expansion of the Technology Transfer area.

Specifically, the Technology Transfer Program developed and widely disseminated design manuals on Small Flow Municipal Waste Water, Phosphorus Removal in Municipal Waste Water and Nitrogen Control in Municipal Waste Treatment Plants. The Program also has published Capsule reports and brochures summarizing major research and development accomplishments for Mixed Media Filtration Processes in the Refining Industry, Sulphuric Acid Pickling Operations in the Steel Industry, Optimum Financial Strategy for Industrial Pollution Control Investments, Logging Practices, and Municipal Waste Water Treatment Alternatives Guide for local decision makers. Regional and National Seminars were conducted on the subjects of Land Treatment of Municipal Waste Water, Fruit and Vegetable Processing, Advanced Municipal Waste Water Treatment Processes, Planning Guidelines for 208 Area-wide Water Planning Agencies and Control of Nitrogen in Municipal Waste Water. All scientific and technical reports including technology transfer publications are available from the National Technical Information Service. For further information, contact: Dr. W. Randall Shobe, Director, Technical Information Division, RD-680, EPA Headquarters, Washington, D.c. 20460, (202) 245-3019, or Mr. Robert Crowe, Director, Environmental Research Information Center, Cincinnati, Ohio 45268, (513) 684-7391.

FEDERAL ENERGY ADMINISTRATION

The Federal Energy Administration (FEA), established on July 1, 1974, strives for positive and effective action to conserve scarce energy supplies and to promote the expansion of readily useable energy sources. The Administration also promotes efficiencies in the use of energy resources and reduction in the growth of U.S. energy demand. The strategy for improving energy efficiency consists of three thrusts: the development of voluntary programs for energy conservation; the encouragement of long term, cost-effective energy savings; and the work toward removal of Government constraints on the free market to allow supply and demand to produce a natural balance.

NATIONAL ENERGY INFORMATION CENTER

The Office of Energy Information and Analysis was assigned responsibility for the National Energy Information Center (NEIC) by the Energy Conservation and Production Act. In 1976, FEA accelerated integrating its data collection and processing systems while expanding coverage of other Federal energy data activities to be incorporated in the National Energy Information System. This activity resulted in the production of the Federal Energy Information Locator System (FEILS) catalog which describes 292 energy-related data programs undertaken by 42 Federal agencies. NEIC, mandated by Congress to serve as the national clearinghouse for energy information, expanded its development of the national energy information base and began implementation of NEIC's national network for energy information exchange. The first of NEIC's Regional Energy Information Services Centers was established in Region Ten to serve as the area's focal point for responses to energy information needs of both the public and the private sectors. In mid-1976, NEIC initiated a program (IDEIS) whose objective is to identify and develop energy information sources throughout the United States. The Center expanded its references, referral and research capabilities. NEIC also continued its support of the Federal Inter-agency Council on Energy Information.

OTHER ACTIVITIES

Cooperative programs were continued with the Energy Research and Development Administration, the Federal Power Commission and the Bureau of Mines of the Department of the Interior. In addition, FEA worked closely with the Commission on Paperwork and the General Accounting Office in efforts to reduce the agency's data collection requirements. For further information, contact: A. H. Linden, Jr., Deputy Assistant Administrator for Data Services, Federal Energy Administration, Room 7202, 2000 M Street, N.W., Washington, D.C. 20461, (202) 254-3910.

GENERAL SERVICES ADMINISTRATION

The General Services Administration (GSA) was established by Section 101 of the Federal Property and Administrative Services Act of 1949. Established as an independent agency in the executive branch of the Government, GSA is responsible for providing economical and efficient management of Government property and records, including the construction and operation of buildings; the procurement and distribution of supplies; the disposal of surplus property; the management of traffic and communications; the stockpiling of strategic and critical materials; the direction and coordination of the Government-wide civil emergency preparedness program; the management of the Government-wide automated data processing (ADP) resources program; and the creation, preservation and disposal of records.

AUTOMATED DATA AND TELECOMMUNICATIONS SERVICE (ADTS)

Federal Software Exchange Program

This program has been instituted by ADTS as part of GSA's continuing effort to encourage Federal agencies in the sharing and joint utilization of automated data Processing resources. The Software Exchange Program (SEP) provides for inter-agency sharing of computer programs and related documentation through the development of an inventory of available Government-owned software for finding programs which meet individual agencies' requirements.

The Federal Software Exchange Center (FSEC), as part of the SEP, has been established at the National Technical Information Service, Department of Commerce, to coordinate the functions involved in the collection, processing and dissemination of software. The FSEC is the central point of contact for Federal agencies seeking software information. It is also the organization to which Federal agencies report software summaries for publication in the Federal Software Exchange Catalog. This catalog, available on an annual subscription basis from the FSEC, contains abstracts of available systems, programs and subroutines written in a wide range of computer languages for a wide variety of hardware and covering numerous application areas. In addition to a short summary of the software's purpose, significant factors, such as processing mode, computer manufacture and model, operating system, programming language(s), input/output media, memory requirements and the prices for obtaining the software and related documentation, are also provided in the catalog. For more information concerning FSEC and its holdings write: Federal Software Exchange Center, 5285 Port Royal Road, Springfield, Virginia 22161.

FEDERAL PREPAREDNESS AGENCY (FPA)

New Information Services and Networks

As part of its continuing efforts to improve techniques for economic analysis, the Mathematics and Computation Laboratory (MCL), FPA, entered into a contract with Dale Jorgenson of Data Resources, Inc., to construct a new dynamic general equilibrium model which contains enhanced inter-industry detail. Interactively with a long term macroeconomic growth model, the equilibrium model provides detail for 35 industry sectors including dynamic industry coefficients and price substitutibility.

Joint Programs with Other Agencies

In 1976 a policy review of stockpile planning procedures was completed. In the spring and summer of 1976, FPA also completed a study of factors significant to the evaluation of stockpile objectives. MCL chaired an inter-agency working group concerned with economic methodology for computing civilian requirements; participated in a number of other working groups; and provided computations of supplies, requirements and imbalances of strategic and critical materials under a wide range of policy alternatives.

Life Cycle Costing

The Federal Supply Service (FSS) has instituted a program for the application of Life Cycle Costing (LCC) techniques in the procurement of selected products. An important feature of this effort has been the development of a 40-hour LCC Workshop which is held at different locations around the country and is open to Federal, State and local procurement officials. FSS has printed documentation of selected LCC procurement applications and the LCC Workbook which is used for training. A new function to be undertaken this year is the development of a Government-wide program to publicize and exchange information on LCC procurement efforts.

NATIONAL ARCHIVES AND RECORDS SERVICE (NARS)

Training Courses

The Office of Records Management, NARS, offers interagency training courses on Micrographic Fundamentals,

Advanced Micrographics, and Word Processing. The courses are also open to persons outside the Federal Government.

Machine-Readable Archives Division

The legislated mandate of the Machine-Readable Archives Division (NNR)--that of preserving computerized Federal records whose value extends beyond the immediate needs of the creating agency--includes a responsibility for preserving Federal scientific and technical information. Federal Property Management Regulations require that agencies cooperate with NARS in establishing "standards for the selective retention of records of continuing value". As candidates for retention, scientific master files are a growing concern of NNR. Machine-readable scientific files from a number of Federal agencies--NOAA, Department of the Interior, EPA, HEW--have been considered for preservation during the past year in the course of establishing general guidelines for the disposition of records from these agencies. One file of particular importance, scheduled for transfer to the custody of NNR for retention and dissemination, is the National Ocean Survey's Nautical Chart Data Base containing digitized hydrographic and topographic data. For further information regarding the holdings of the Machine-Readable Archives Division, contact: Charles Gellert, Machine-Readable Archives (NNR), National Archives and Records Service, Washington, D.C. 20408, (202) 724-1080.

PUBLIC BUILDINGS SERVICE (PBS)

Life Cycle Planning and Budgeting Model

The Public Buildings Service has recently completed the development of a life cycle planning and budgeting model (LCPBM). The intent of this model is to provide a system that heightens the awareness of the total cost of facility ownership. The model will aid in establishing life cycle cost budgets at both the building and systems level, in addition to forecasting alternative life cycle costs for operations. The LCPEM consists of three subcomponents. These subcomponents calculate the quantity characteristics of system interfaces on a parameter basis; apply unit cost to resultant quantities for the calculation of both acquisition and operational costs; and finally, provide an economic model for the treatment of cash flow, discount factors and inflation over given time frames.

Life Cycle Costing

PBS has published a manual for the use of its contract Architect-Engineers and staff in determining the life cycle cost of the particular building under design. The manual, entitled "Life Cycle Costing in the Public Buildings Service, Volume II", contains instructions, examples and forms for the development of the total estimated cost of the facility, its elements and systems over a 40-year timespan, as well as an equivalent uniform annual cost based on present worth analysis. This particular application of life cycle costing is designed to maintain GSA's financial solvency under the Federal Buildings Fund.

Construction Management Control System

PBS now has a mandatory nationwide requirement that all new PBS construction projects greater than five million dollars apply a standardized construction management control system (CMCS) to the management of the design and construction process. This is a network-based management system for schedule, cost and financial control. The system employs both computer-generated and manually prepared analyses and reports. All progress schedules, progress payment, shop drawing control, change order control and financial management reports are computer-generated. Systematic cost control is accomplished by manual take off and pricing, with some computer-generated cost control reports. PBS plans within the next year to modify CMCS to incorporate the PBS UNIFORMAT system of cost classification, to develop a mechanism for establishing a computer-based project cost data base and to otherwise improve the effectiveness of the cost and financial control aspects of the system.

Energy Conservation Guidelines for Existing Buildings

"Energy Conservation Guidelines for Existing Office Buildings", published in February 1975, will be updated in February 1977. This document is intended to be used primarily by GSA in the remodeling, maintenance and operation of approximately 10,000 office buildings in its inventory. A goal of 75,000 BTU per gross square foot per year of energy input at the building boundary and 150,000 BTU per gross square foot per year of raw source energy, has been established for use by architects and engineers in the redesign of Federal office buildings. If the recommendations are followed, it is possible to realize savings of 20 to 30 percent over current energy consumption in existing buildings. The document is now on sale to the construction industry and the general public through GSA Business Service Centers.

Energy Guidelines for New Office Buildings

GSA first published the document "Energy Conservation Design Guidelines for New Office Buildings", in January 1974 and updated it in July 1975. Guidelines are necessary to ensure that the designs of all new Federal office buildings are energy efficient. The initial issue was a spin-off from the research effort in connection with the Manchester, New Hampshire, Energy Conservation Demonstration Project. The Guidelines are currently in use in the GSA regional offices, and over 12,000 copies have been distributed free to other Federal agencies and State and local governments and sold to other interested parties through the GSA Business Service Centers.

The second edition of these Guidelines reflects GSA's reaction to the comments received on the initial issue and includes new material on solar energy systems and computer analysis of building thermal characteristics and energy requirements. The skillful application of these Guidelines will make it possible to meet an energy goal of 55,000 BTU per square foot per year at the building boundary, and 100,000 BTU per square foot per year of raw source energy, which will reflect a reduced energy consumption of up to 50 percent over the current price. This document is now on sale to the construction industry and the general public through GSA Business Service Centers.

Energy Conservation Guidelines for Building Operations

This booklet, originally published as "Conservation of Utilities", was redesigned, updated and reissued in 1976. "Energy Conservation Guidelines for Building Operations" is another step in GSA's overall energy program. These guidelines are not directed toward architects and engineers, nor do they involve the retrofitting of existing buildings. The recommendations are aimed at managers and their staffs--the people who keep our buildings sufficiently lighted, adequately cleaned, heated and air-conditioned to acceptable temperatures.

The energy-saving suggestions offered in this book are practical. Some involve using only a wrench or screwdriver to make a minor adjustment, or simply reviewing a utility rate schedule. In the long run, actions like these can make a significant contribution to our national energy conservation effort. Single copies of this booklet are available without cost from:

Assistant Commissioner for Buildings Management
General Services Administration
18th and F Streets, N.W.
Washington, D.C. 20405

Energy Conservation Demonstration Building

The new Federal Office Building, recently constructed in Manchester, New Hampshire, was designed from the beginning to be GSA's Energy Conservation Demonstration Building. This building includes many innovative features to reduce the energy required to operate the building. Energy conserving features are provided in the following general areas: Basic Architectural Design (Configuration, Orientation, Fenestration, Insulation); Mechanical-Space Conditioning; Electrical and Lighting; and Plumbing. Different mechanical-space conditioning systems are provided on each of the office floors to permit a direct comparison of their performance and energy efficiency. A large solar collector is provided on the building roof to provide approximately 25 percent of the energy required for building heating and cooling, thus reducing the demand on conventional energy sources. The building is expected to operate with at least 40-60 percent less energy usage than comparable modern existing buildings.

The Federal Energy Administration and the National Bureau of Standards have joined with GSA to make a full yield evaluation of the innovative features after occupancy, based on a sophisticated built-in instrumentation system and a survey of occupant reaction. The building, in effect, is a living laboratory.

Environmental Demonstration Building

The new Federal Office Building recently constructed in Saginaw, Michigan, includes many innovative environmental and energy conserving features, such as low heat gain/heat loss through walls, some of which are protected by earth berms; earth fill and landscaping on one-third of the roof; rainwater collection from around the building and from parking areas for a lawn sprinkler system; purified and recycled flushing medium for toilets and urinals, thus eliminating the need for municipal water for this purpose; and an energy-efficient space-conditioning system. In addition, an 8,000 square foot solar collector is expected to provide all of the energy required for domestic hot water and a major portion of the energy required for building heating and cooling. A full field evaluation of the performance of the innovative features is planned, based on a sophisticated built-in instrumentation system and survey of occupant reaction.

Technical Manual to Assess Environmental Impacts

GSA has recently completed a manual for use by GSA Regional and Central Office staff in assessing environmental impacts. It is intended to assist them in the preparation and review of draft and final environmental impact statements. The focus of the work is restricted to those impacts resulting from typical actions undertaken by GSA, i.e., new public buildings construction, repair and alteration of existing public buildings and the disposal of surplus real property.

Systems Approach to Firesafety

The GSA goal-oriented systems approach to firesafety, first applied to a limited extent in the Seattle Federal Building, has been fully developed and has been applied to a number of Federal buildings. The systems approach is an innovative mathematical method of dealing with the complex factors which combine to make a firesafe building. Instead of designing to a fixed consensus code, a level of safety is selected and the building is designed to that level of safety. Since starting the program, many buildings employing the goal-oriented systems approach have been completed and are in operation; others are in various stages of design and construction. The systems concept has been well received by the Society of Fire Protection Engineers and the National Fire Protection Association and is being studied by several major consensus code groups. Courses on the use of this concept are regularly held at Worcester Polytechnic Institute and the University of Wisconsin.

Safety and Fire Evaluation Model

The Safety and Fire Evaluation Model (SAFEM) was developed for GSA under the Safe Work Space for Federal Employee's Study Program by Weiss, Jenny, Elster and Associates (WJE). The fire portion of the model was developed for WJE by Firepro, Inc. This model was developed in such a way that formulas, standardized descriptions and the computer can be used to bring more accuracy and timeliness to the huge task of maintaining an inventory on the safety of GSA buildings. The model aids in ranking buildings according to their vulnerability, various hazards and other values. It is designed to assist in setting priorities for inspections and engineering studies of buildings when the model reveals a potential risk. At the present time, only major hazards such as hurricanes, tornadoes and earthquakes, are under consideration, but the capability for expanding SAFEM's use is practically unlimited.

Design Criteria: New Public Buildings Accessibility

GSA has just issued "Design Criteria: New Public Buildings Accessibility". This document provides design

professionals with criteria for planning new public buildings which are barrier-free and are accessible to the physically handicapped. The accessibility criteria reflect consideration of sensory, mobility and activity limitations.

The document contains three categories of statements--requirements, recommendations and notes. The requirements must be followed in all construction projects where a Government contract exists. Recommendations are not mandatory in the average public building but should be followed whenever possible. Notes are included for general information and aid interpretation of the standards when special programs are undertaken.

To facilitate the use of "Design Criteria", a supplementary manual is being developed for helping design professionals apply the general criteria to the design process and to building program requirements for new construction. The supplementary "Applications Manual" will list the key decisions regarding accessibility that should be made during the course of an individual project.

Open Planned Office Acoustics

PBS has developed performance criteria and reproducible test methods to ensure speech privacy in open planned office space. Test method PBS-C.1, "Method for the Direct Measurement of Speech Privacy Potential (SPP) Based on Subjective Judgment", uses a jury of three technical observers alternating as speaker, monitor and listener to determine Speech Privacy Potential (SPP). SPP requirements can be verified through an objective test, PBS-C.2, "Method for the Sufficient Verification of Speech Privacy Potential (SPP) Based on Objective Measurements". The criteria, which are now requirements in all PBS office space, have been incorporated in the PBS Performance Specification for Office Buildings. The criteria have also been incorporated in performance specifications for the separate procurement of an integrated ceiling and background system and for free-standing space dividers. These test methods have been submitted to the American Society for Testing Materials (ASTM) Committee E-33 on Environmental Acoustics for eventual adoption as ASTM tests.

In addition, a publication entitled, "A User's and Manager's Guide to Office Acoustics", is being prepared. Its purpose is to explain office acoustics, particularly open office acoustics, in non-technical terms to the manager, who makes decisions affecting building design, and to the user who has limited knowledge of acoustics.

For further information, contact: Mrs. Dawn Linthicum, Management Systems Division, Office of Management Services, Office of Administration, General Services Administration, Washington, D.C. 20405, (202) 566-1777.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

The National Aeronautics and Space Administration (NASA), established to conduct research on the solutions to problems of flight within and outside the Earth's atmosphere and to conduct activities required for the exploration of space with manned and unmanned vehicles, generates a vast amount of scientific and technological knowledge in a great variety of disciplines and fields. In order to maximize the utilization of this knowledge, NASA has the specific obligation to provide for the widest practicable and appropriate dissemination of information concerning its activities and the subsequent results.

AEROSPACE SAFETY INFORMATION

The contents of over 10,000 documents characterizing safety engineering became one of the series accessible on NASA/RECON when the files of the Aerospace Safety Research and Data Institute (ASRDI), formerly located at the NASA Lewis Research Center, Cleveland, Ohio, were merged with the on-line NASA scientific and technical information data base. The search series includes safety literature in cryogenic fluid safety, fire and explosion technology and the mechanics of structural failure. A report, *Vocabulary of Aerospace Safety Terms* (NASA TM-X-73521), has been issued. It contains a listing of specialized terms to facilitate the proper selection of information from this file.

INTERNATIONAL ACTIVITIES

NASA's Scientific and Technical Information Office works closely with the European Space Agency (ESA) in exchange of documents and with the European Space Agency (ESA) in exchange of documents and machine-readable scientific and technical information. Bibliographic citations covering information acquired by NASA are regularly disseminated to ESA to assure availability to all European member countries. In return, ESA acquires scientific and technical information generated by its members, as well as by other European nations. This is abstracted and indexed by ESA and transmitted to the NASA system. ESA also follows the NASA guidelines in preparation of microfiche to assure compatible microfiche interchange. It also provides translations of significant European scientific and technical journals and individual documents.

NASA participated in the October 1976 meeting of the Technical Information Panel of the NATO Advisory Group for Aerospace Research and Development (AGARD), held in Washington, D.C. NASA's Deputy Assistant Administrator for Technology Utilization served as Chairman of this Panel. During 1976, the Scientific and Technical Information Office (STIO) prepared one custom bibliography for inclusion in the AGARD Lecture Series publications and continued work on a multiyear cumulative index to AGARD reports published during 1974-76. A cooperative effort also continued to update the AGARD *Multilingual Aeronautical Dictionary*. The Dictionary will be produced by NASA computer and will be available through remote computer terminals in both the United States and Europe. An additional feature of the magnetic tape availability will be the ease and economy of updating.

In addition to these major international efforts, STIO maintains bilateral exchange agreements with 228 governmental, industrial, research, academic and other private sector organizations in more than 54 countries.

THE JPL COMPUTER-ASSISTED COMPOSITION SYSTEM

The Technical Information and Documentation Division (TIDD) of the Jet Propulsion Laboratory (JPL), California Institute of Technology, a NASA contractor, has been actively involved with computerized composition systems for several years. Within the past year, a unique automated system was installed. This system is one of the most advanced Text Processing Systems (TPS) available. It features many sophisticated text manipulation capabilities derived from its basic design concept which provides extended capabilities through application of special software programs.

The JPL TPS is a five terminal system with each terminal capable of inputting and editing the data files. All terminals are coupled electronically to three high-speed printers. All terminals display any previously stored data on a gas-plasma screen which minimizes operator eye strain. The terminals can be operated simultaneously, each manipulating different stored data. Consideration is being given to increase the number of stations.

The average daily input capacity of JPL's system is approximately 22,000-25,000 words. Last fall, an optical character reader was added to the TPS which increases its input capacity to an additional daily input of between 100,000-120,000 words. A new laser printer is being investigated that may produce printed pages at the rate of one page every three seconds.

The NASA Langley Research Center subsequently established a similar system.

NASA LIBRARY NETWORK

To permit more effective support of the many users and reduce per-unit processing costs, the NASA libraries cooperated in implementing a NASA-wide library network. The post-1968 book and journal holdings of the NASA Headquarters and 11 NASA Center libraries, together with selected portions of the Library of Congress Machine-Readable Catalog (MARC) are searchable on the NASA data base. Known as the NASA Library Network (NALNET), this on-line system offers multiple access to over 200,000 book citations and 6,000 journal titles. Searches, including full text searching with proximity relationships, may be made by title; author; LC, NASA, and MeSH terms; LC card numbers; various classifications; corporate sources; and contract and grant numbers. Services available include current awareness lists, computer-printed catalog cards, shelflists and other products incorporating local or network holdings.

NASA SCIENTIFIC AND TECHNICAL INFORMATION OFFICE

The NASA Scientific and Technical Information Office is responsible for the dissemination of the results of NASA research and development and for managing the NASA scientific and technical information program. Two of the primary operational elements of this program are the Government-owned NASA Scientific and Technical Information Facility, Linthicum, Maryland, operated under NASA contract by Informatics Information Systems Company and the Technical Information Service of the American Intitute of Aeronautics and Astronautics, New York City.

Important special NASA publications in 1976 were *Evolution of the Solar System* by Hannes Alfven and Gustaf Arrhenius (NASA SP-345), *Viking 1: Early Results* and *Mission to Earth: LANDSAT Views the World* (NASA SP-360).

A motion picture, ACCESS (the title having reference to access to the information in the NASA data base, NASA libraries and other outlets), was cited by the American Society for Information Science (ASIS) as the Outstanding Information Science Movie of 1976. The film, produced by the NASA Scientific and Technical Information Office, had also earned the Silver Award for Technical Documentaries at the 1975 International Film and TV Festival of New York.

During 1976, about 85,000 new document citations from 3,000 worldwide report sources and from 1,500 scientific and technical journals were added to the IBM 360/65 data base, which now contains citations to more than 1.9 million documents related in the broadest sense to aeronautics and space. Of the new citations, 75 percent were announced in the abstract journals *STAR (Scientific and Technical Aerospace Reports)* and *IAA (International Aerospace Abstracts)*. Announcements of ongoing aerospace research compiled by the Smithsonian Science Information Exchange were also included in *STAR*; 4,700 subscriptions to this abstract journal were placed in 1976.

Analysts at the NASA Scientific and Technical Information Facility carried on the literature search service to NASA-related organizations. Over 18,000 searches (including 8,000 resulting in printout of citations) were performed during 1976 using the interactive NASA/RECON (REmote CONsole) system. Other information specialists and individuals having access to NASA/RECON terminals at NASA Headquarters and Research Centers performed searches also. Access to the data base was made available through dial-in terminals over telephone circuits to 45 of NASA Industrial Applications Centers and major universities.

An undated version of the *NASA Thesaurus*, the controlled vocabulary by which all documents are indexed, was published during the year. This edition (NASA SP-7050) contains a new feature for user assistance, an *Access Vocabulary*, which provides multiple access by means of a permuted index to all multiword terms in the *Thesaurus*.

A data tagging and flagging experiment, jointly supported by NASA and the National Science Foundation, was initiated to examine the usefulness of indexing tabular or graphical data in documents entering the system and of providing brief data summaries following the abstracts in the abstract journals (*STAR* and *IAA*), in printed literature searches and in the NASA/RECON CRT-displayed citations.

Over 3 million copies of documents, 80 percent in microfiche form, were provided to more than 1,100 organizations, of which half were in the private sector. The combined individual user community is estimated to be in excess of 100,000. Any domestic Government contractor engaged in manufacturing or research and development related to aerospace may receive automatic distribution of NASA documents through subscription. Certain NASA document and announcement services are available without charge to NASA-associated organizations and educational institutions.

NATIONAL SPACE SCIENCE DATA CENTER

The National Space Science Data Center (NSSDC), located at Goddard Space Flight Center, Greenbelt, Maryland, is the main repository of space flight experiment data and the international distribution center for secondary users of such data. Data sets with supporting documentation supplied to users in 1976 totalled 785. Requests for documentation and data from outside the United States are handled through the World Data Center A (WDC-A) for Rockets and Satellites, which is operated within NSSDC for the WDC-A coordination office of the U.S. National Academy of Sciences.

NSSDC/WDC-A publishes the *SPACEWARN Bulletin* which provides information about recently launched satellites, provides international designations, gives frequencies of radio beacons in orbit which contribute to ionospheric or geodesic studies, identifies telemetry data available for reception and use by others, lists satellites used for optical or photographic tracking and gives pre-launch and post-launch reports from various spacecraft. The SPACEWARN system is coordinated through the International Council of Scientific Unions' Committee on Space Research (COSPAR). In 1976, 490 copies of *SPACEWARN* were distributed to 46 countries.

The Sounding Rocket Launch Report contains information regarding the launch date, type of rocket, discipline classification of each experiment, success/failure for rocket and experiments and the name and addresses of the experimenters. During the year, 270 copies of this report were distributed to 35 countries.

NSSDC/WDC-A also issues the *International Magnetospheric Study/Satellite Situation Center Reports, Report on Active and Planned Spacecraft and Experiments* and the *Space Investigations Documentation System Report*.

SHUTTLE INFORMATION SYSTEM

At the Lyndon B. Johnson Space Center (JSC), Houston, Texas, the Document Index System (DIS), an interactive on-line computerized information system, became operational during 1976. This system supports the Shuttle Information System (SIS) by maintaining a comprehensive data base which contains documentation pertaining to developments in Space Shuttle technology and other allied publications. The DIS data base, which is maintained on direct access mass storage files on a Cyber 70-series computer, is a modification of the JSC Information Bank System and will replace the latter system as the prime information retrieval tool for Space Shuttle documentation. DIS, while available to Space Shuttle activities throughout the country, is accessible through direct searching only to JSC Shuttle organizations and their contractors. Other NASA Centers, Air Force Facilities and their contractors can access the data base by use of remote CRT-display consoles.

For further information on NASA science information activities, contact: George P. Chandler, Jr., Director, Scientific and Technical Information Office, Office of Industry Affairs and Technology Utilization, National Aeronautics and Space Administration, Code KS, Washington, D.C. 20546, (202) 755-3548.

NATIONAL SCIENCE FOUNDATION

The National Science Foundation (NSF) contributes to progress in scientific and technical information in several ways. Primarily, NSF generates scientific and technical knowledge through its broad support of research, both basic and applied, in many areas of science and technology. The results of this research, to a great extent, appear in the published literature. In addition, the results of the research supported by some of the Foundation's directorates are reported in the technical literature and are made available through NTIS.

NSF also supports efforts to improve the mechanisms which make available scientific and technical information to scientists, engineers, educators, managers and other groups. NSF's primary instrument for this purpose is the Division of Science Information (DSI). However, other elements of NSF contribute to the support of research designed to improve computer and telecommunications applications, and still others occasionally assist organizations in publishing scientific and technical monographs and serials; from time to time, they assist professional societies and other groups in the creation and maintenance of collections. Considerable attention is given to exploring possible improvements in scientific curricula and associated activities which will contribute to scientific education from the grade school to university level. Support is provided to scientists and engineers to attend meetings in other countries to present papers and to acquire information about scientific research being done elsewhere. As another aspect of its international activities, NSF, through DSI and the Division of International Programs, participates in programs to aid international organizations concerned with the interchange of information and individual countries seeking to improve their respective scientific and technical communication capabilities.

Finally, NSF's contribution to scientific and technical communication activities includes a program conducted through the Directorate for Research Applications which focuses on the utilization of R&D results for national needs.

DIRECTORATE FOR SCIENTIFIC, TECHNOLOGICAL, AND INTERNATIONAL AFFAIRS

Division of Science Information

The Foundation's responsibilities were significantly expanded in 1958, following enactment of the National Defense Education Act. Title IX of that Act directed NSF to establish a Science Information Service to:

- (1) "provide, or arrange for the provision of indexing, abstracting, translating, and other services, leading to a more effective dissemination of scientific information", and
- (2) "undertake programs to develop new or improved methods, including mechanized systems, for making scientific information available".

NSF has implemented this mandate by "arranging for the provision of improved means for dissemination of scientific information," rather than by operating its own science information services. Consequently, funds have been used to support research and development whose results can contribute to improvements in public and private services.

In 1976, the Office of Science Information Service was renamed the Division of Science Information and placed in the Foundation's Directorate for Scientific, Technological, and International Affairs.

Activities in Fiscal Year 1976

In Fiscal Year 1976, 5.9 million was obligated by the National Science Foundation in support of science information activities managed by DSI. These funds were used to support 85 projects across the four main DSI programs. These programs were:

- Information science research
- User requirements research
- Access improvement research
- Management studies and coordination.

INFORMATION SCIENCE RESEARCH. Fundamental research on information science problems, development of theoretical bases for new science communication systems; development of performance measures for information systems; and applications of advanced communication technologies for improvement of scientific communication services.

In Fiscal Year 1976, 11 information science projects were supported. Among these were analyses of:

- Information transfer processes (Dean Goffman, Case Western Reserve University)
- Computer networking simulation (Dr. James Emory, EDUCOM; economics of computer networking; Dr. Donald Dunn, Stanford University)
- Methods of easing burdens of users of large files (Dr. Peter Schipma on retrieval effectiveness, IITRI; Professor Martha Williams on data base selector possibilities, University of Illinois; Dr. Frank Reintjes on coupling of interactive systems, M.I.T.)
- Information structure of the language of science (Dr. Naomi Sager, New York University)
- Performance measures of information systems (Dr. Thomas DeLutis, Ohio State University).

USER REQUIREMENTS RESEARCH. Applied research on conditions affecting use of scientific and engineering information; impact of organizational policies and practices on use of scientific information; information requirements of various user groups; development of curricula

and training materials on the use of scientific and technical information resources; development of user-responsive and cost-effective information services for scientists and engineers.

The 29 research projects supported under this program included:

- Development and evaluation of user education curricula and materials (Mr. Arthur Elias, BIOSIS; Dr. Marvin Marcus, University of California, Santa Barbara; Dr. Charles T. Meadow, Drexel University; Dr. Thomas G. Kirk, Jr., Earlham College; Dr. Joseph DiSalvo, Indiana University; Dr. Dale Rummer, University of Kansas; Dr. Dorothy Caruso, University of Pittsburgh; Dr. Herbert Fox, New York Institute of Technology)

- Impacts of technology and communication innovations on users (Dr. Julius T. Tou on telebrowsing, University of Florida; Dr. Gerald Jahoda on effects of on-line searching of chemists information usage, Florida State University; Mr. Roger K. Summit on on-line searching in public libraries, Lockheed Research Laboratories; Dr. Stuart Myers on videoimage transfer by means of slow scan television, Northwestern University)

- Studies to provide planning concepts and data for managers of services (Dr. Russell L. Ackoff on idealized design of a national system, University of Pennsylvania; Dr. Norman NIsenoff on forecasts of communication technology, Forecasting International; Dr. Gerald Zaltman on application of marketing theory to science communication, University of Pittsburgh; Dr. Albert Smigel on marketing of information to industry, Pennsylvania Science and Engineering Foundation)

- Assessment of innovations in scientific communication (Dr. Theodore Melnechuk on services to a small scientific community, Western Behavioral Sciences Institute; Dr. Albert Rubenstein and Dr. Charles Thompson on critical issue analyses in scientific and technical communication, Northwestern University).

ACCESS IMPROVEMENT RESEARCH. Applied research on ways of transmitting newly discovered information into the public record; providing access to the public record of science and technology; and identifying, locating, obtaining and using information.

Among the 28 access improvement projects supported in Fiscal Year 1976, the following were illustrative:

- Studies of improved means for capturing literature and data (Mr. David L. Staiger on data banking methods, American Institute of Aeronautics and Astronautics; Mr. William E. Burke on editorial processing operations, Aspen Systems Corporation; Mr. John H. Veyette on accessing engineering numerical data, Engineering Index, Inc.; Dr. John Murdock on assessment of means for accessing numerical data, Informatics, Inc.; Dr. Thomas L. Humphrey on an editorial processing center experiment, Stanford University)

- Assessment of electronic information exchange (Dr. Murray Turoff on development of an electronic communication test facility, New Jersey Institute of Technology)

- Support of library and information systems standards activities (Dr. Jerry Orne for Z-39 operations, University of North Carolina; Ms. Toni Bearman on common practices for bibliographic data bases, National Federation of Abstracting and Indexing Services; Mr. Joseph Price on development of a national serials data base, Library of Congress)

- Assessment of electronic technologies for application to science communication (Dr. Donald L. Stewart, Xerox Electro-Optical Systems; Mr. A. Ray Ezaz on remote access to full-test files, QEI, Inc.; Mr. Donald King on alternative electronic configurations for scientific communication, Market Facts, Inc.).

In addition, the Access Improvement Program stimulated and supported development of a planning guide on innovations in dissemination of scientific information, under the direction of Mr. William A. Creager, Capital Systems Group, Inc.

MANAGEMENT STUDIES AND COORDINATION. Research on the economic and structural characteristics of the scientific and technical information (STI) enterprise, national issues affecting scientific and technical communication and the economics of information transfer; analyses required for improving coordination among public and private STI services; and support for exchange of scientific information with other countries and for U.S. participation in international scientific and technical information organizations.

Seventeen projects were funded under the new economics of information research emphasis. These included:

- Collection of data about the scientific and technical communication enterprise (Mr. Donald King on scientific and technical information indicators, Market Facts, Inc.; Mr. Douglas Price on library photocopying practices, National Commission of Libraries and Information Science; Dr. Fritz Machlup on production and distribution of scientific and technological information, New York University)

- Analyses of the attributes of information (Dr. William J. Baumol, New York University)

- Cost-benefit analyses (Dr. Allen Kent on use of library materials, University of Pittsburgh; Dr. Joseph J. Talavage on economic characteristics of information analysis centers, Purdue University).

Coordination and related national and international activities were carried out through grant-supported and staff activities. Grant-supported activities included:

- Payment of dues for U.S. participation in the Committee on Data for Science and Technology (CODATA); the Abstracting Board of the International Council of Scientific Union (ICSU/AB); and the International Federation of Documentation (FID)

- Assistance to the Smithsonian Science Information Exchange to seek cooperative arrangements with foreign services and encourage compatibility among relevant national services.

- Assistance for bilateral and other science and technology information exchanges with the U.S.S.R., India, Mexico, Japan and Egypt.

Communications

In 1976, DSI further increased its communication and dissemination activities. As with all NSF programs, announcements of newly funded projects were submitted to SSIE. Reports of final projects were routinely forwarded to NTIS as well. In addition, DSI staff arranged a number of symposia featuring DSI grantees. Many of these were scheduled in conjunction with annual meetings of professional societies. Examples include: American Association for the Advancement of Science, the National Federation of Abstracting and Indexing Services, Special Library Association, the American Economic Association, American Society for Engineering Education, Council of Executives of Scientific and Engineering Societies, Industrial Research Institute and the Engineering Foundation. Other seminars were held at the Foundation.

DSI also continued to arrange periodic meetings of managers of Federal scientific and technical information systems. These meetings featured discussions of common problems and analyses of important issues affecting public and private information services.

During 1976, a number of reports were published by DSI or its grantees. These included:

Statistical Indicators of Scientific and Technical Communication, 1960-1980: Volume I--A Summary Report. This report provides the first comprehensive description of the U.S. scientific communication enterprise, from the generation of scientific and technical information to its use. Estimates of total obligations for recording, distributing and using scientific and technical information are also provided.

The SCATT Report--A Tentative Idealized Design of a National Scientific Communication and Technology Transfer System. This book reports the results of 25 workshops with scientists, publishers, librarians and information scientists on ways to guide the emergence of a user-oriented, self-adaptive system for science communication and technology transfer (SCATT).

A National Approach to Scientific and Technical Information in the United States. This report presents a rationale and framework for a national program of scientific and technical information compatible with the new directions of science and the pluralistic nature of science information activities in the United States.

Scientific and Technical Information: Options for National Action. This report summarizes the recommendations of previous national studies of scientific and technical information issues as well as ... legislative history of P.L. 94-282. It presents several options for clarifying national scientific and technical information policies and practices.

Federal Scientific and Technical Communication Activities: 1975 Progress Report.

Division of International Programs

The Foundation's Division of International Programs (INT) fosters international cooperation in research, the exchange of scientists and the transfer of information between U.S. and foreign scientists. INT's programs and activities include the following:

- bilateral research, exchange and seminar programs with 15 countries
- the Special Foreign Currency Research Program
- a National Academy of Sciences Exchange Program with the academies of the U.S.S.R. and East European countries
- U.S. participation in international scientific organizations
- international travel grants.

Bilateral Research and Exchange Programs

The foundation served as lead or executive agency for cooperative science programs with Argentina, Australia, Brazil, France, Hungary, India, Italy, Japan, Mexico, New Zealand, Poland, the Republic of China, Romania, Spain and the U.S.S.R. U.S. scientists participated in joint research projects, seminars and exchange-of-scientists programs with these countries. Under the Latin American Cooperative Science Program, funds were provided for 26 cooperative scientific activities in 6 countries. The East European Cooperative Science Program supported 24 grants for work involving American Scientists and those of Hungary and Romania. Thirteen joint working groups implemented cooperative research in the areas of the U.S.-U.S.S.R. Agreement on Cooperation in Science and Technology.

Special Foreign Currency Programs

The Foundation awarded grants for cooperative research projects in excess-currency countries and made travel awards to U.S. scientists to attend meetings, develop projects and visit or work in laboratories in these countries (Egypt, India, Pakistan, Poland and Tunisia). Eight contractors in these countries translated approximately 58,000 pages of scientific literature from 20 languages in 1976. These contractors also translated 1,500 patents and compiled 19 issues of an educational bibliography. Translations are available to the public through NTIS.

National Academy of Sciences Exchange Program

The Foundation supported scientist-exchange programs between the National Academy of Sciences (NAS) and the respective Academies of Science of the U.S.S.R. and the East European countries. In 1976, 100 U.S. scientists visited the U.S.S.R. and East Europe, and 107 scientists from these countries visited the United States. Partial support was provided to NAS for scientific exchange with the People's Republic of China.

International Organizations

U.S. scientific participation in planning, organizing and conducting international science activities in both governmental and non-governmental organizations is also supported by the Foundation. The work of the International Institute for Applied Systems Analysis (IIASA) in Vienna was partly supported by NSF through the National Academy of Sciences, which is the U.S. member. NSF contributed toward NAS participation in 23 international scientific unions and organizations on behalf of the U.S. scientific community.

International Travel Support Programs

The Foundation provided travel support for over 500 U.S. scientists to attend international scientific congresses and symposia outside the United States during 1976.

DIRECTORATE FOR ASTRONOMICAL, ATMOSPHERIC, EARTH, AND OCEAN SCIENCES

Division of Astronomical Sciences

The Division of Astronomical Sciences (AST) regularly supports symposia and the publication of symposia proceedings, anthologie , and tables which would not normally be published in scientific journals. Last year, four such works were published.

- *Galaxies and the Universe,* Allan Sandage, Mary Sandage and Jerome Kristiean, Eds., (Stars and Stellar Systems series Volume X, Gerard P. Kuiper, General Ed.), 818pp., The University of Chicago Press, Chicago, 1976.
- *Jupiter,* Tom Gehrels, Ed., 1254pp., The University of Arizona Press, Tucson, 1976. (The University of Arizona Press, NASA Headquarters, the Pioneer Project Office, NSF and the International Astronomical Union shared the costs jointly for *Jupiter.*)
- *Proper Motion Survey with the 48-inch Schmidt Telescope--Part XLVIII: Proper Motions for 2852 Stars, Another*

White Dwarf, and Part XLIX: Proper Motions for 2981 Faint Stars, William J. Luyten, University of Minnesota, Minneapolis, 1976.

- *An Atlas of Spectra of the Cooler Stars--Types G,K,M,S, and C*, Philip C. Keenan and Raymond C. McNeil, Ohio State University Press, 1976.

Additionally, The National Astronomy Observatories published several technical reports which have been mailed to interested scientists throughout the world.

Division of Atmospheric Sciences

The Division's Climate Dynamics Program supports two efforts in scientific and technical information transfer. The first effort focuses on a project being conducted at Woods Hole Oceanographic and Atmospheric Institution (WHOI). This project involves the digitizing and keypunching of certain bathythermographic data which is not included in the present files of the National Oceanographic Data Center (NODC), National Oceanic and Atmospheric Administration (NOAA). The bathythermogram (BT) tape deck of the NODC, which began in the early 1950's, omits some 225,000 observations made in the North Atlantic Between 1940 and mid-1950's; these observations are not on file in the WHOI data collection. As of December 4, 1976, 30,048 BT observations had been digitized, key punched and put on magnetic tape in NODC format.

The second effort entails the supporting activities provided by the Climate Dynamics Program, the Environmental Data Service and NOAA at the University of Arizona Tree-Ring Laboratory which is developing the International Tree-Ring Data Bank (ITRDB) and the Laboratory of Tree-Ring Research Data Base (LTRDB). The International Tree-Ring Data Bank is a centralized storehouse of tree-ring data from around the world and provides optimal research data availability and the protection of data from loss. Initiated in 1974, the Bank is presently accepting only precisely dated and well-replicated data, primarily ring widths. By the end of 1976, the collection included 155 different sites from 11 countries representing donations from one institution and 17 individual contributors. Contributions and inquiries may be addressed to the Data Bank Manager at the Laboratory. Furthermore, the information in the collection will be available to non-contributors within two years when a substantial data base will have been established and a suitable computer retrieval system will have been developed.

At present, LTRDB consists of magnetic tapes which contain precisely dated individual ring-width measurements for approximately 500 sites. The tapes contain approximately 6,000 pieces of data for each site chronology. The Laboratory also has chronology tapes with data for all chronology series held by the Laboratory which encompass approximately 700 chronologies.

Division of Earth Sciences

The Division of Earth Sciences supports U.S. parcitipation in the International Seismological Centre (sic), presently associatgd with the University of Reading, United Kingdom. This center, sponsored through the International Union of Geodesy and Geophysics (IUGG) is the ultimate repository of world earthquake data. It collates all observational data received from seismological stations throughout the world and publishes monthly bulletins on the characteristics of all reported earthquakes. In addition, the center publishes a semiannual bibliography of seismology and a semiannual regional catalog of earthquakes, as well as world and regional seismicity maps.

Furthermore, the Division of Earth Sciences supports the microfilming and distribution of seismograms from the foreign stations of the Worldwide Standardized Seismic Network (WWSSN). NOAA will assume this support in 1978.

Deep Sea Drilling Project

The Deep Sea Drilling Project (DSDP) offers to the scientific community a wide range of services on geological and geophysical information collected by the project since 1968. The primary means of disseminating such information has been the *Initial Reports of the Deep Sea Drilling Project*, a series of volumes published by the U.S. Government Printing Office. At the time of this writing, some 30 volumes in the series have been published, and at least 13 more are planned or are in varying stages of preparation. Data available from DSDP include bathymetric profiles and core and lithologic data.

DSDP has prepared a summary of core material and available information to guide researchers in locating materials relevant to their studies. As a complement to the summary, a computerized search system called GUIDE-SEARCH has been developed. This data retrieval program is designed to search a master file and extract records for cores which fit a user-defined set of conditions.

The project represents not only a collection of core material, but also an invaluable collection of marine geologic data available to researchers throughout the world.

Division of Polar Programs

The Foundation funds and manages the U.S. Antarctic Research Program as well as being the specified clearinghouse for and the source of Antarctic research information. The Foundation's responsibilities also encompass the administration of an Arctic Research Program and the promotion of the exchange of Arctic research data.

During the year, the Library of Congress continued to abstract and index Antarctic scientific and technical literature under contract to the Foundation. This project covers the works of all countries from 1951 to the present and has listed over 22,000 titles. Results are disseminated monthly through *Current Antarctic Literature*. This literature is indexed and bound in volumes published every 18 months as the *Antarctic Bibliography*.

The American Geophysical Union continued publication of the *Antarctic Research Series*. To speed production and lower costs, former "volumes" are now published as separate papers suitable for the purchaser's collation and binding. An NSF grant partially supported this series.

Centers at the State University of New York (SUNY) at Buffalo, the Florida State University and the Smithsonian Institution continued to receive and curate polar ice core, sediment core, rock and natural history specimens. Computer catalogs at each institution contain this information on the specimens and are available to all researchers.

During 1976, the Foundation published the quarterly *Antarctic Journal of the United States* as well as the quarterly *Arctic Bulletin*. One entire issue of the *Arctic Bulletin* was devoted to a report on Federal research in the Arctic during FY 76.

International Decade of Ocean Exploration

The Office for the International Decade of Ocean Exploration (IDOE) negotiated a contractual agreement with the Environmental Data Service (EDS) of the National Oceanic and Atmospheric Administration, to provide for the archiving and dissemination of data developed by U.S. participants in the IDOE. Working cooperatively with EDS, the IDOE Office developed guidelines for the submission and dissemination of the environmental data collected to insure that the data were adequately documented, cataloged, disseminated and stored. EDS receives copies of all scientific reports generated by IDOE projects, and these copies are forwarded to the appropriate data centers as well as to NTIS for further dissemination.

DIRECTORATE FOR MATHEMATICAL AND PHYSICAL SCIENCES AND ENGINEERING

Division of Chemistry

The Chemical Analysis Program has renewed its support of a program at Clarkson College of Technology entitled "Compilation, Critical Evaluation and Publication of Polarographic and Related Electrochemical Data". The program will expand and update a comprehensive but critically evaluated compilation of the fundamental data that have been obtained on organic, organometallic, biochemical and inorganic substances by polarography and a number of related electrochemical and electroanalytical techniques.

In April 1976, the National Academy of Sciences accepted a Division proposal to "study the present status, needs and benefits of data compilation and evaluation in relation to the national research and development effort". With Academy support, the proposal was funded jointly by the Division of Chemistry and the Division of Science Information.

Division of Engineering

Electrical Sciences and Analysis Section

Information-related functions of this Section incorporate such activities as workshops and conferences which help to acquaint the industrial and academic engineering community with the results of NSF-supported research.

In the Automation, Bioengineering and Sensing Systems Program, research continues on the theoretical and experimental problems associated with extracting information from large data sources. Automated techniques for extracting main ideas and performing decision analyses on images, remotely sensed data and biomedical data are being explored to permit machine reduction of large information banks. Image enhancement and reconstruction techniques contribute to improving the amount of information conveyed to the user. Additionally, annually held workshops result in the exchange of research information within the scientific community.

The Systems Theory and Applications Program supports research studying information flow in dynamic systems. For example, one focus of investigation is the notion of feedback which implies in the information dynamics area that decisions should be based on the most current information emanating from the system under control. Further areas of research include estimation theory, concerned with methods of extracting information from noisy signals, and coding theory, concerned with the characterization of information for efficient transmission.

Engineering Mechanics Section

The engineering community is developing a recognition of computer software as a valid form of scientific and technological information. A recent workshop in Inter-University Civil Engineering Computer Software held at the University of Illinois at Urbana made the following two recommendations: to recognize "Software Engineering" as a traditional research discipline within civil engineering and to establish a center type activity. The summary report, to be made available through NTIS, should be completed by the spring of this year.

Division of Mathematical and Computer Sciences

The Division of Mathematical and Computer Sciences supported studies to assist in developing the resource-sharing potential of computer networking for science research and education. Emphasis was placed on pertinent organizational, political, legal and economic considerations, including network management and the need for specialized resources and services. Efforts to stimulate basic research on problems of data structure and organization were undertaken. Particular emphasis was placed on the study of algorithms for searching and sorting very large files and on research on the data structures associated with those algorithms. The Division supported research in theoretical computer science and in programming systems bearing on the fundamentals of coupling computers and information.

Applied Mathematics and Statistics Program

The Program supports research on mathematical problems which arise in many contexts of communications. Work on combinatorics is related specifically to the mathematical theory of communication, information theory and switching theory. The Program contains investigations into the mathematics of laser communications with particular attention to amplification and levl degeneracy. Certain areas of electromagnetic wave propagation and scattering theory which are of concern in communications are included in the research efforts. Research on finite groups relevant to coding theory is part of the Algebra program.

Division of Physics

The Division is providing partial support for two publications compiling data resulting from physics research:

- *Atomic Energy Levels and Grotrian Diagrams, Vol. I*, by Stanley Bashkin and John O. Stoner, Jr.

- "Particle Properties", April 1976, compiled by the Particle Data Group and published in *Reviews of Modern Physics*, Vol. 48, No. 2, Part II, April 1976.

DIRECTORATE FOR RESEARCH APPLICATIONS

The National Science Foundation's Research Applied to National Needs (RANN) program focuses U.S. scientific and technical resources on selected problems of national importance for the purpose of contributing to and accelerating their solution. RANN is an intermediary between basic research and the development, demonstration and general utilization of research results by industry, State and local governments and related Federal mission agencies. Each project supported by RANN involves the submission of a utilization plan, the submission of project reports to the RANN Document Center and the National Technical Information Service and possibly the use of other existing information systems.

RANN systems used to communicate scientific and technical information include those maintained by the RANN Communications Programs and by individual programs in the various RANN Divisions. The RANN Communications Programs support the RANN Document Center, the RANN Symposium, films, exhibits and various audience-oriented communication activities funded through grants or contracts. The League of Women Voters and the National Conference of State Legislatures serve as examples of RANN grantees in this last category.

In the various RANN Divisions, individual research programs support a wide range of information systems and employ a wide range of techniques to communicate research results to diverse audiences, to catalyze a particular field of research and to build a community of researchers and users. These systems and techniques include: information centers; newsletters; conferences; directories; bibliographies, state-of-the-art syntheses and handbooks; personnel exchange; advisory panels and committees; use of existing organizations and journals; support for new institutions and networks; films and videotapes; and the publication of reports commercially or through the Government Printing Office. Each program and project may employ one or more of these various systems and techniques.

During 1976, Capital Systems Group, Inc. of Rockville, Maryland continued to augment the report dissemination activities of the RANN Document Center. With the assistance of Capital Systems, an automated system for storing and processing a document inventory and bibliographic data and for producing various management and bibliographic products has been operating. Capital Systems has continued to perform a wide range of information activities for RANN as a whole. These activities include processing, storing, filing and disseminating RANN documents; processing RANN documents for NTIS; fulfilling requests for and conducting mass mailings of RANN documents; exhibiting RANN materials at selected conferences throughout the Nation; and producing *Recent RANN Reports*, a review of research results.

One example of an information dissemination activity supported by a specific RANN program is the Information Center Complex of Oak Ridge National Laboratory. The Center provides information support services to the NSF-RANN program, Chemical Threats to Man and the Environment, intended for the users of the information generated by program research. The services include the following:

- the preparation of overview documents summarizing current literature on halogenated organic compounds and focusing on the organohalides of strategic environmental and human health concern
- the publication and distribution of a bimonthly abstract journal and a newsletter covering all research results published by Chemical Threats program grantees
- the annual publication of the *Chemical Threats Directory* which lists program participants
- the management of a technical information system file
- the operation of an environmental response and referral center which provides literature searches, bibliographies, summaries of information and replies to specific questions.

Researchers, governmental agencies, industrial organizations and individuals concerned with the environmental and human health aspects of trace contaminants are all users of the Information Center's services.

For more information on NSF science information activities, please contact: Dr. Lee G. Burchinal, Director, Division of Science Information, National Science Foundation, 1800 G Street, N.W., Washington, D.C. 20550, (202) 632-5824.

VETERANS ADMINISTRATION

Congress created the Veterans Administration (VA) in 1930 and charged it with the mission to provide eleigible veterans and their families with special benefits.

The Veterans Administration accepts responsibility for research and development benefiting two groups--veterans and, in many cases, the country and world at large. The VA also makes the information generated by its activities widely available. Because of VA's specialized mission, individual offices in the Administration generally publish their own results, and no separate group is responsible for information exchange.

The Veterans Administration makes full use of existing information systems to distribute scientific and technical data, as well as other information of interest to Federal agencies and the public. The information systems include those managed by the National Bureau of Standards (NBS) and the National Library of Medicine (NLM); the "Statistical Reporter", published by the Office of Management and Budget (OMB); and the Smithsonian Science Information Exchange (SSIE).

The Controller's Office ensures that the information is consistent with official VA statistics and determines whether such information should be provided at VA expense or on a cost recovery basis in accordance with OMB Circular A-25. The Controller's Office also prepares the agency's Annual Report to the President and Congress, Based on material furnished by the various VA departments and staff offices. This report contains more detail on the agency's mission and specific activities and is sold through the Superintendent of Documents, U.S. Government Printing Office.

HEALTH CARE PROGRAMS

Exchange of Medical Information Program

The VA's unparalleled health care delivery system of 171 hospitals and 215 outpatient clinics is a nationwide resource. Operation of this vast system carries with it a mandate to provide the best possible care to every eligible person who comes to a VA facility, regardless of its location. The VA must constantly look to the latest scientific and technological developments to determine their impact on the delivery of quality care. The VA's Exchange of Medical Information (EMI) Program accomplishes this challenge. This program supported 18 pilot projects in biomedical communications during 1976 by providing grants to medical schools, hospitals and research centers and by direct funding to VA hospitals.

The following are three examples of EMI projects conducted in 1976:

Nuclear Medicine Network. The Nuclear Medicine Service of the VA Hospital, St. Louis, MIssouri, implemented a pilot project to provide nuclear medicine services to patients in outlying VA hospitals.

The system links the central analysis site at the Cochran Division of the St. Louis hospital with peripheral VA hospital laboratories in St. Louis, Missouri; Marion, Illinois; and Poplar Bluff, Missouri. The network uses electronic techniques and computer instrumentation to record and transmit clinical nuclear medicine data to the core facility for analysis and interpretation. The system provides high quality nuclear medicine diagnostic services to facilities that could not otherwise be served because of chronic shortages of nuclear medicine specialists.

REMOTE APPLICATION OF AXIAL TOMOGRAPHY USING WHOLE BODY TRANSMISSION SCANNING. A project, involving the VA hospital in Boston, Massachusetts, and Tufts-New England Medical Center, was initiated to explore the feasibility of sharing the component structures of whole body computerized axial tomographic (CAT) units. The objective is to extend diagnostic capabilities of radiology to outlying or remote hospitals at reduced cost. The facilities will attempt to transmit to and from remote locations previously recorded data, scans which are in progress, as well as the subsequent assessments regarding the clarity of transmitted information. In addition, the project will initiate an exchange of medical information for both patient care and teaching purposes.

TEL-COMMUNICOLOGY. A pilot project, assisting persons with communicative disorders residing in areas remote from audiology-speech centers, serves rural areas of Alabama and parts of Mississippi and Florida. This program uses specially adapted telephonic systems, programmed materials and educational media to serve veterans with speech, language and voice problems.

During the year, a total of 52 patients have received 1,252 sessions and 626 hours of services. Their communicative disorders included laryngeal speakers, dysphasic speakers, motor speech disorders, voice problems, articulation defects and stuttering.

Medical Research

During the past years, medical research programs in the Veterans Administration were under way at about 130 facilities, with some 3,600 principal investigators engaged in about 6,000 studies. Other investigators conducted 24 cooperative (multi-hospital) studies. The VA published 6,160 research reports in the professional literature, and its staff presented approximately 6,000 papers at various medical meetings. The Smithsonian Scientific Information Exchange (SSIE) collects and disseminates reports on all projects currently in progress.

The titles listed below constitute samples of some of the studies which have been published by VA.

- Brain Tumors Treated with Steroid
- Liver's Role Cited as Protector for Infectious Diseases

- Report on Post-Transfusion Hepatitis
- Survival with Inoperable Lung Cancer
- Lung Cancer Surgery Evaluated
- Preoperative Radio-Therapy for Colorectal Cancer Evaluated
- Reliability Studied in Evaluating Coronary Angiograms
- LAAM Compared with Methadone in Treating Addiction
- Spinal Cord Injury Research
- Russian Physicians Visit Spinal Cord Injury Center

Cooperative Studies — Multi-Hospital Research

The VA's Department of Medicine and Surgery has demonstrated a unqiue capacity for collaborative biomedical and clinical research. The VA Cooperative Clinical Studies Program Health CAre Facilities often work with medical schools to study a problem under a uniform protocol, which insures that the data from separate institutions can be treated as if from one source. This procedure allows a large number of cases to be accumulated within a shorter period. The Cooperative Study of Post-Transfusion Hepatitis illustrates this effectiveness. Data from 2,788 patients at 13 VA hospitals over a period of 6 years (1969-1974) formed the basis of the study. Investigators reported the incidence of the disease, determined its characteristics and identified factors which increase the risk of contracting the disorder.

Library Operations

During 1976, several advances were made in the library network's access to automated data bases of biomedical literature. Through additional sharing agreements and intensified in-service training, the 30 libraries accessing MEDical Literature ON-LINE (MEDLINE) now provide this bibliographic service to all VA libraries. The data bases available from the National Library of Medicine contain medical literature indexed from 1974 to 1976, with backfiles from 1966 to 1973. Thus, VA personnel can rapidly select needed information from over 2 million medical journal articles.

The Central Office Library tested the Lockheed Corporation's DIALOG system which makes available 37 separate data bases covering, among others, such fields as chemistry, biology, psychology, engineering management, agriculture and sociology. The system includes journal literature, reports, dissertations and books. VA has evaluated the feasibility of using complementary data bases at additional sites.

VA has also utilized automated data bases for cataloging. CATaloging On-LINE (CATLINE) identifies all books cataloged by the National Library of Medicine in the past ten years. A more sophisticated system available at the Ohio College Library Center (OCLC) is under study for possible production of computer-produced catalog cards and a union list of books.

The VA union list of periodical holdings is currently in its fifth edition. Also published was an abridged union list of audiovisual software (16mm films, audiocassettes, videocassettes and slides) from 25 facilities.

Training is essential to effective library service. The VA assists in the training of librarians while they are still in graduate school. It also works with its practicing librarians to insure that current technical knowledge and innovative techniques are used to the fullest.

VA Cooperation With Other Federal Agencies

The Veterans Administration/National Science Foundation (NSF) ultrasound program, with the Director of the VA Nuclear Medicine Service serving as Project Director, continued development during 1976. The project funded 12 color plates, correlating ultrasound images with cross-sectional anatomy, for the Leopold and Asher Atlas of Ultrasound. Additionally, VA awarded a contract for the production of ten videotapes which will illustrate to the practicing physician how ultrasound can help him in his day-to-day work with patients. In conjunction with the Food and Drug Administration (FDA), the VA/NSF program funded the development of an ultrasound instrument calibrator that will be standard for all human use of ultrasound devices.

The VA also cooperated with many other Federal agencies in programs such as the VA/Department of Health, Education, and Welfare program on evaluation of cancer therapies throughout the year.

An agreement with the FDA for the exchange of information on medical devices constituted another cooperative activity of VA. The data exchange system proliferated at an accelerated pace and greatly enhanced the capability of the VA Marketing Center to keep all VA health care facilities fully informed on items which may be of inferior quality or which lack a total functional patient care benefit. Product hazard alerts were also dispatched throughout the vast network of VA medical care facilities and numerous other Federal agency operations which utilize the resources of the VA to support their medical supply needs.

Engineering Service Center

The Veterans Administration established an Engineering Service Center in St. Louis, Missouri, a pilot project for the development of a technical documentation archive of information concerning actual medical instrumentation which the VA is currently using. The ultimate size of this library will probably exceed 8 million pages and will include complete maintenance information for intra-agency use on approximately 110,000 individual medical devices. Furthermore, the Engineering Service Center acquired limited copyright releases which allow dissemination of this documentation only within the Veterans Administration's Health Care Facilities. Documentation is currently available in three forms--paper duplicates of original documentation, diazo duplicate microfiche and, in cases of immediate and urgent need, telecopied facsimiles of specific information. Agency-wide conversion to microfiche use for medical equipment maintenance documentation resulted in a better system of documentation control at smaller cost than traditional paper copy.

Preventive Maintenance Program Guides

In recognition of the need for establishing procedures and protocols for the maintenance of medical instrumentation and realizing the commonalities within many types of this instrumentation, the VA's Engineering Service developed 113 G-29 Program Guides as a supplement to its MP-3. These Program Guides were designed to facilitate the understanding of the operation and principles of maintenance of classes of medical instrumentation, such as defibrillators, electrocardiographs, general purpose X-ray generators and

ultrasonic nebulizers. Furthermore, these guides outline the underlying principles upon which the equipment operates and discuss routine maintenance. The guides also include equipment checkout procedures with schedules for their use.

The acceptance of these guides continued throughout the health care community. Distribution of the guides to the private sector exceeded 23,000 copies before the National Technical Information Service (NTIS) assumed distribution responsibilities. The guides are now available from NTIS in either paper or microfiche form. Accession numbers assigned to these guides are PB-245110/AS, PB-245108/AS, PB-245112/AS, PB-24109/AS and PB-245111/AS. For further information concerning availability of the guides, contact the U.S. Department of Commerce, NTIS, Springfield, Virginia 22161.

TECHNOLOGY IN BUILDING CONSTRUCTION

The reports are available through the U.S. Government Printing Office and the National Technical Information Service. In addition, VA prepared and released articles to technical magazines and publications in the building technology field. Materials and statements were also released at technical and professional meetings, such as American Institute of Architects, National Fire Protection Association, American Society of Heating, Refrigeration, and Air Conditioning Engineering, and American Hospital Association. Furthermore, the VA Information Service distributed news releases on completed study reports to newspapers and other publications. Examples of recent study efforts include the following:

- Design Handbook on "Directional Graphics for VA Hospitals". This Handbook serves as a source of design criteria for new and existing signage systems for VA Hospitals. (Copies are available from U.S. Government Printing Office, Washington, D.C. 20402, Price: 2.10, Stock No. 051.000 00097-8.)

- "Development of Seismic Protection Provisions for Furniture, Equipment, and Supplies". The study describes practices and standards which are essential to the continued operation of a VA Hospital following a major earthquake. (Published by Government Printing Office, Washington, D.C. 20420, 0-210-851 (C24).)

- "Development of Design Guidelines on Solar Energy, Selective Energy and Heatpump Systems for VA Medical Facilities". This study effort focused on the means to reduce energy consumption. (Available from VA, Office of Construction (08C) in format of building design criteria at cost of reproduction.)

"Trial Installation of a Solar Energy System". With provisions for accurate monitoring to serve an existing VA Research Building, this program also developed more accurate design criteria for similar future installations. (Magazines in building design field released and published the description.)

"Trial Installation of Energy Bank Concept at a VA Nursing Home". The system will store ice or heat for later use. (Technical magazines in building design field released and published the description of the concept.)

AUTOMATIC DATA PROCESSING

VA's extensive computer systems, operated at six data processing centers, affect virtually all veterans and their beneficiaries. Some of these systems take full advantage of the most up-to-date automated data processing equipment and techniques.

The Target System will provide on-line computer services for regional offices to facilitate payment of benefits. Additionally, the system will permit on-line inquiry and response concerning status of claims. With this capability, processing centers can complete transactions on pending claims immediately, without waiting for time-consuming transmission of data to the computer center by mail.

The Beneficiary Identification and Records Locator System is an on-line index for approximately 35 million veterans and their beneficiaries to provide identification and location of claims records. During 1976, VA installed a major upgrading of computer software supporting this system to prepare for the increased workload anticipated with the Target System. Because of this expansion, the system can process greater volumes of records in the on-line environment, and generalized system support features will facilitate other new and rewritten subsystems to easily convert to real-time processing. Terminal inquiry and update of computer files will significantly improve speed and accuracy of several computer applications.

The Logistics System assists in managing the vast quantities of supplies and equipment in a most efficient and economical manner. In May 1976, VA personnel completed the conversion of station inventories, and the entire inventory of equipment and supplies stocked in depots and warehouses now resides in one of VA's large scale computers.

The Automated Prescription Processing, Labeling, Editing and Storage System is an on-line, fast response system for outpatient prescription processing. Remote visual display and printer terminals located at VA pharmacies utilize telephone lines for computer entry and retrieval of patient medication data including generation of prescription and mail labels, worklists, refill or renewal requests and patient medication profiles. Reduction and elimination of backlogs in the refill mail-out program, as well as readily accessible information to respond to patient and physician inquires results in improved service. Additionally, automated controls are included to guard against prescription duplication and excessive drug use.

The Patient Treatment File System consists of approximately 6 million patient records. These records contain patient identification, beneficiary classification and clinical information concerning diagnoses, surgical procedures and medical treatment episodes. The system also produces the diagnostics, operations and surgical indices which are required by the Joint Commission on the Accreditation of Hospitals. VA has converted the formerly printed indices to microfiche formats resulting in cost avoidance for paper and additional computer utilization. In addition, VA has conducted a feasibility study using the optical character recognition techniques to scan approximately 1 million input documents prepared by health care facilities.

During the year, Veterans Administration developed the *VA Data Dictionary*, which was specifically tailored to manage and control data resources. The dictionary indicates data element characteristics and function in automated data processing systems, including the relationship of elements to files and reports within each application. Additionally, the dictionary recommends standards concerning composition and utilization of elements as guidelines for a consolidated, well-documented data resource. Furthermore, VA participated in the National Bureau of Standards task group to develop standards and guidelines for defining and safeguarding information maintained in automated systems of records. VA also was active in an interagency task group on data element directives under the Federal Information Processing Standards program.

TELECOMMUNICATIONS

In 1976, VA expanded its telecommunications activities in many areas in order to keep abreast of sophisticated technological developments in the industry and to provide support for a broad variety of programs at field stations.

With the establishment of an Inter-VA Processing Center Telecommunications Network, all the data processing centers efficiently and effectively exchanged information via electronic transmissions. This network, consisting of minicomputer transceivers, featured full redundancy (duplicate resources in case of full or partial breakdown) with unlimited expansion and total standardization in hardware, software and operation. This redundancy feature gave the network the capability of high-speed transmission as well as total network switching versatility.

The network also augmented VA/General Services Administration Advanced Record System transmissions, thereby resulting in a flexible information exchange on a national basis.

During 1976, VA concluded its efforts on the Application Technology Satellite (ATS-6) experiments. A similar program began on January 13, 1976, with the launching of the Communications Technology Satellite (CTS) from Cape Kennedy. CTS coverage will encompass 11 western states and parts of Mexico and Canada. The VA's role in the CTS program has been to conduct biomedical and clinical experiments among 32 hospitals as well as to determine and publish the feasibility and cost-effectiveness of such communication. These experiments will begin in September 1977, with full color television broadcasting.

For more information on VA science information activities, contact: Mr. John J. Leffler, Associate Deputy Administrator, Veterans Administration, 810 Vermont Avenue, N.W., Washington, D.C. 20420, (202) 389-2641.

GOVERNMENT PRINTING OFFICE

The Superintendent of Documents is responsible for the sale of Government publications, the compilation of catalogs and indexes of Government publications, the distribution of Government publications to depository libraries and the mailing of publications for members of Congress and Government agencies. These responsibilities are fulfilled through the Document Sales Service, the Documents Support Service and the Library and Statutory Distribution Service.

During the course of the year, the Superintendent of Documents reported many significant advances in efforts by the Government Printing Office (GPO) Documents personnel to improve service to millions of GPO customers.

The Library and Statutory Distribution Service, which administers the cataloging and indexing program, the depository library program and the statutory and reimbursable mailing program, accomplished the following during 1976:

- Cataloged 63,500 documents
- Distributed 27.6 million publications to depository libraries
- Distributed 62.3 million publications required by statute and reimbursable mailings
- Mailed 691,000 consigned and agency orders
- Inspected and exchanged information with 412 depository libraries
- Reduced backlog in mailings to depository libraries; current mailing is accomplished within 72 hours of receipt for 95 percent of new receipts
- Issued the *Monthly Catalog* in the MARC format using the Ohio College Library Center computer tapes, greatly reducing production time
- Completed the Microfilm Pilot Project authorized by the Joint Committee on Printing and submitted an evaluation
- Expanded to eight the number of computer terminals connected to the Ohio College Library Center. One printer, when used with the CRT terminal, produces hard copy for editing and verification of catalog entries.

CUSTOMER SERVICE

During the year, great emphasis has been focused on improving customer service. In addition to processing customer inquiries, orders and adjustments within ten working days, many internal processing refinements have been instituted. Many customer orders received were not applicable to GPO's sales program or contained erroneous information. Daily, thousands of these inquiries and orders were apprehended immediately after opening the mail and returned to the customer with specific information for further processing. Samplings of completed but unmailed customer orders increased nearly 3-fold during 1976 and have contributed to a 40 percent reduction in processing errors. Important letters, complaints and adjustments are being controlled with the aid of a mini-computer.

DEPOSITORY LIBRARY COUNCIL TO THE PUBLIC PRINTER

The Council met on two occasions in 1976, once in Columbus, Ohio on April 22-23, and once in Arlington, Virginia on October 21-22. GPO staff also attended important library workshops, seminars and meetings across the country.

DEPOSITORY LIBRARY PROGRAM

The number of depository libraries increased to 1,209 from the previous year's total of 1,170. In 1976, 32,565 individual titles were distributed to depository libraries. Thirty-three depository libraries participated in the program to convert and test the *Code of Federal Regulations* in microfiche. In printed form, the *Code* requires 9 1/2 feet of shelf space for 73,500 pages and weighs 168 pounds. In microfiche format, it stands 4 inches high and weighs 14 1/2 pounds.

During December 1976, 100 depository libraries participated in a test of the Documents' Master Publications Reference File in microfiche format. This file, which is updated periodically, contains some 24,000 entries, representing salable items. The file consists of about 105 microfiche in a 48:1 reduction ratio format. In addition, a User Manual has been distributed to all the participating libraries. Indications are that a majority of the 1,201 depository libraries will participate on a continuing basis to receive cataloging data on all titles in the sales programs. Furthermore, a supply of document sales order blanks has been made available to the depository libraries holding the sales microfiche, as an aid to customers wishing to purchase publications.

DOCUMENT SALES

The Document Sales Service manages the worldwide sales program. Sales program accomplishments during 1976 include the following:

- Reduced by 50 percent (to 10 working days) the time for internal processing of customers' orders, inquiries and adjustments
- Established the Sales Order and Information System and initiated the entering of selected publication orders into a new computer system
- Consolidated all sales bulk stock into a new 300,000 sq. ft. warehouse facility in Laurel, Maryland
- Reduced customer back orders by 80 percent
- Closed Philadelphia Documents Distribution Center (PDDC) and shifted workload to PDDC, Pueblo, Colorado
- Issued Price List 36, *Government Periodical and Subscription Services*, in an alphabetical format
- Installed an internal comprehensive postage accountability plan to sample and compute postage due U.S. Postal Service

- Extended controlled correspondence to include customer adjustments
- Began shipping tube mail by United Parcel Service
- Opened new Houston bookstore in suburban shopping center
- Instituted a new college textbook system to assure specific deliveries
- Employed management consulting firm to assist in accelerating mail flow

Customer data:
- 8.5 million customer orders filled
- 1.6 million letters of inquiries serviced
- 74.2 million copies sold
- 3.2 million mailing addresses maintained

FIVE YEAR PLAN

Many elements have been incorporated in the approved GPO 5-Year Plan in order to provide definition as to where the Documents Service is headed. Concentrated efforts have been made to further automation, to accelerate internal order processing time to five working days from the present ten and to reduce the amount of internal paperwork.

INTERAGENCY COUNCIL ON PRINTING AND PUBLICATION SERVICE

Public printer Thomas F. McCormick established the Interagency Council on Printing and Publication Service. The 12-member council consists of printing officers and administrative representatives from the Departments of Agriculture, Commerce, Defense, Interior, Labor, Treasury and Health, Education, and Welfare; the Library of Congress; the National Aeronautics and Space Administration; the General Services Administration; the U.S. Postal Service; and the National Labor Relations Board, plus two top level Government Printing Office managers. Additionally, the Staff Director of the Joint Committee on Printing and the Public Printer serve as ex-officio members of the Council. The Council has focused on major problem areas from the standpoint of all Federal agencies and the general public. As a result of this emphasis, some printing and publication services have been improved and recommendations have been submitted to alter existing regulations and policy.

MONTHLY CATALOG

The *Monthly Catalog of U.S. Government Publications* is published pursuant to Sections 1710 and 1711 of Title 44 of the United States Code. Each issue is an indexed listing of publications issued during the previous month by agencies in all branches of the United States Government.

In 1976, 63,500 publications were cataloged for listing in the *Monthly Catalog*. This figure includes individual issues of periodicals as well as monographs ranging from general information leaflets to highly scientific and technical dissertations. Beginning with the entries for the July 1976 *Catalog*, the Superintendent of Documents joined the Federal Library Information Network (FEDLINK) and became a contributor to and user of the Ohio College Library Center (OCLC) data base for preparation of the *Catalog*.

A total of 13,508 copies of the *Monthly Catalog* is distributed to 1,209 depository libraries and 10,687 subscribers. The subscription list includes individuals, libraries and other organizations, and some addressees receive more than one copy.

SALES ORDER AND INFORMATION SYSTEM

The Superintendent of Documents established the Sales Order and Information System (SOIS) as a comprehensive data automation mechanism to enhance the sales data bases and the subscription and publication fulfillment systems. Some 25 modules of programming efforts are under development to enhance existing data processing routines or expand automation applications to accommodate retail inventories; deposit account and Government account transactions; refunds; data retrieval for inquiries and adjustments; and accounting for bookstores and consigned agents. These building blocks are codified in the GPO 5-Year Automated Data Processing Plan.

For further information on GPO, contact: Carl A. LaBarre, Assistant Public Printer (Superintendent of Documents), U.S. Government Printing Office, Washington, D.C. 20402 (202) 275-3345.

LIBRARY OF CONGRESS

The Library of Congress (LC) concentrates on every topical field except clinical medicine and technical agriculture, which are the subject specialities of the two other national libraries, the National Library of Medicine (NLM) and the National Agricultural Library (NAL).

LC's collection of some 80 million items in every subject and in a multitude of languages includes such materials as newspapers and periodicals from all over the world; manuscripts; maps; music, both classical and modern; phonographic disks, tapes and wires; photographic negatives, prints and slides; prints and drawings; motion pictures; microfilm; books in braille and talking books on record and tape; broadsides; posters; and many other items.

Regular LC publications include *Quarterly Journal of the Library of Congress, Library of Congress Information Bulletin* (weekly staff news publication), *Library of Congress Publications in Print* (annual) and *Calendar of Events in the Library of Congress* (monthly), all available free from the Central Services Division.

The Information Office provides information about the Library, its activities, services and special events. Each of the various divisions furnishes specialized information services.

AUTOMATED INFORMATION SERVICES TO CONGRESS

In the area of computerized services, the Congressional Research Service (CRS) offers Congress both direct support, in the form of information retrieval files, systems analysis and programming, and indirect support through the use of automation supplementing CRS research and information analysis activities. Direct computer applications are spearheaded by what has become the automated service best-known to the Congress, the Library's SCORPIO information retrieval system, which provides and maintains on-line legislative, bibliographic, issue-analytic and other information files for direct congressional access. After more than a year's intensive study and evaluation, the Senate Committee on Rules and Administration in the summer of 1975 began installation of videoscreen (CRT) terminals throughout the Senate. By the end of 1976, this installation was virtually complete, with some 93 CRT terminals in member offices and another 22 in the offices of various committees and Senate officers.

CRS has also worked closely with the House Commission on Information and Facilities in the establishment of an experimental network linking the computers of the House Information Systems with those of the Library of Congress. In this network, CRT terminals have been installed in some 30 House offices. The terminals are connected to the House computers, but can access SCORPIO files through the computer-to-computer high-speed communications link. Staff members of the CRS Information Systems Group trained House network participants in all SCORPIO procedures.

In addition to the 30 offices participating in the experimental network, by the end of the year more than 70 additional House offices had installed dial-up terminals of their own and were regularly searching SCORPIO files. Staff members of these offices were trained by personnel of the CRS Information Systems Group, which also routinely handles trouble-shooting calls for these offices.

CRS files within SCORPIO include a Bill Digest File which provides content and status information on all legislation introduced in the 93rd, 94th and 95th Congresses; a Bibliographic Citation File containing references to articles in some 6,000 Government, United Nations, congressional and professional journals from 1974 to the present; and a Major Issues File which, at the end of September 1976, consisted of some 238 "issue briefs"--concise, analytical papers on major public policy topics.

DECIMAL CLASSIFICATION ACTIVITIES

The Decimal Classification Division completed the design and planning phases for the preparation of the 19th edition of Dewey, scheduled for publication in 1979. The Decimal Classification Editorial Policy Committee at its November 1976 meeting gave final approval to all draft schedules. The Committee also decided that the radical draft of 780 (Music) which had been prepared in England will not be incorporated into the 19th edition, but may be issued later as a separate edition.

MARC ACTIVITIES

Organizational Changes

Several organizational changes bearing on MARC activities have taken place within the last year. On April 12, 1976, Henriette D. Avram, formerly Chief of the MARC Development Office, became Special Assistant for Network Development in the Office of The Librarian (now the Director of the Network Development Office). This is a new position created to focus attention on and to accelerate networking activities related to bibliographic services. In January 1977, L. Clark Hamilton, formerly Deputy Register of the Copyright Office, will become Assistant Director for Bibliographic Systems, directing the newly established Bibliographic Systems Office in the Administrative Department. Joseph W. Price, formerly Chief of the Serial Record Division, Processing Department, became Chief of the MARC Development Office, which was transferred from the Processing Department to the Administratiave Department. Mr. Price will also serve as Deputy Assistant Director, Bibliographic Systems Office.

The Bibliographic Systems Office now comprises the following units:

- the MARC Development Office, which will continue to have primary responsibility in developing and maintain-

ing systems in support of the technical processing activities of the Processing Department.

- the Copyright Systems Applications Group, which will continue to develop and maintain systems in support of the Copyright Office.

- the Library Systems Applications Group, which now supports activities in the Reader Services Department and the Research Department and will, in the future, support the Law Library and bibliographic applications of the Administrative Department.

Conversion Activities

The Library's major conversion efforts are performed by the MARC Editorial Division, Processing Department, with systems support and development provided by the MARC Development Office. By January 1977, MARC coverage will be expanded to include all current cataloging in Roman alphabet languages. Input of catalog records representing sound recordings and music scores, originally planned for fiscal year 1977, has now been deferred until fiscal year 1978. Activity is now proceeding in various units of the Library of Congress in preparation for the input of name authority records beginning in early 1977.

Since July 1976, all newly input records for books have been corrected and verified on-line via a CRT terminal. This change in mode of operation enabled the MARC Editorial Division to verify approximately 797,776 monograph records (books, films, COMARC), a 25 percent increase over the same period during the previous year. In addition, approximately 16,437 books and film records have been updated, a 51 percent increase, and 10,345 CIP (Cataloging in Publication) records have been updated to full MARC records, a 2 percent increase.

In addition to the on-line correction and verification of newly input book records, the off-line input system is being replaced with an on-line data collection system. Data are keyed on-line, but computer processing is done in a batch mode. The off-line magnetic tape electric typewriters are being replaced by CRT terminals, the same device used for on-line correction.

Efforts to explore the various aspects of cooperative input continue through the CONSER Project and the COMARC Pilot Project. The CONSER (Conversion of Serials) Project became operational in the Library of Congress on June 22, 1976. This two-year project is designed to create a cooperative data base of 200,000 to 300,000 records. The project is under the management of the Council on Library Resources (CLR) and uses the facilities of the Ohio College Library Center (OCLC) under contract. The initial data base consisted of Library of Congress MARC serial records (approximately 28,700), Minnesota Union List of Serials records (approximately 85,000) and National Library of Canada (NLC) serial records (approximately 5,000). This fall, CONSER admitted the U.S. Department of Interior and Harvard University libraries as new members. There are 14 participants in the project overall.

The Library's responsibilities within the project are to input its new records for serials (4,253 have been added since July 1976) and to authenticate the records input or updated by other participants, except NLC, which inputs and authenticates records for Canadian imprints. The Library of Congress and NLC are the authentication centers for the bibliographic portion of the records; the National Serials Data Program and the International Serials Data System/Canada are the authentication centers for ISSN/Key title. Each week the new records input, records newly authenticated and authenticated records that have been corrected by both the Library of Congress and NLC, are sent to the Library from OCLC on magnetic tape in the MARC communications format. The Library of Congress incorporates all titles on the weekly tapes into its MARC serials data base and distributes them to subscribers in the regular monthly, MARC Distribution Service- Serials. The Library distributed a total of 4,455 full-level authenticated records through this service during the year. It is planned that the management and operation of CONSER will later be moved to the Library of Congress. A study team, partially funded by a grant from CLR, composed of staff from the MARC Development Office, Serial Record Division and CLR, is currently defining the system and resources required to implement the system (CONSER II) at the Library of Congress.

The COMARC (Cooperative MARC) Pilot Project is being conducted under a grant which was made to the Library by CLR in December 1974 and which was recently extended through December 1977. Its purpose is to explore the feasibility of expanding the number of MARC records that can be made available through the Library's MARC Distribution Service by utilizing the Library of Congress records converted into machine-readable form by other agencies. Participants in the project are selected on the basis of the completeness of the bibliographic data contained in their records and adherence to the MARC format and conventions for content designation. Records are submitted to the Library of Congress in the MARC communications format. The headings and other access points are compared with those existing on the card in the Library's Official Catalog, and the access points in the COMARC record are brought up to date where necessary. At present, 11 agencies have been selected as participants. The COMARC Pilot Project has been closely coordinated with the Register of Additional Locations (RAL) project, and locations reported on COMARC records are input to the RAL file.

Distribution Activities

The machine-readable records created through either the Library's conversion efforts or the efforts of various cooperating agencies are made available through the MARC Distribution Service, an activity of the Cataloging Distribution Service, Processing Department. Records are distributed on magnetic tapes weekly or monthly to over 65 subscribers in the United States and abroad. Three new MARC Distribution Services were introduced in 1976. The MARC Distribution Service--Books (Canada) consists of records for books of Canadian imprint. These records constitute the books portion of the Canadian national bibliography, *Canadiana*, and are received in the Library of Congress through a non-exclusive exchange agreement with the National Library of Canada. The MARC Distribution Service--Books (COMARC) consists of records emanating from the COMARC Pilot Project. The MARC Distribution Service--Subject Authority consists of two parts--a master file, which at present contains data from the eighth edition of *Library of Congress Subject Headings* and its annual supplements through 1975, and a non-cumulative quarterly file consisting of new, changed or deleted records processed during the quarter. A new cumulated master file (for new subscribers) will be issued each year.

In addition to these new services, records emanating from the CONSER Project were first distributed in July 1976 through the MARC Distribution Service--Serials. By the end of calendar year 1976, the Library of Congress had made available in machine-readable form catalog records for 724,716 books, 37,973 films and other audiovisual materials, 34,462 serials and 28,913 maps. Also 11,659 COMARC records,

29,359 Canadian records for books and 121,012 subject authority records had been distributed.

Plans are currently under way for an 18-month pilot project with the Research Libraries Group (consisting of the libraries of Columbia, Yale and Harvard Universities and the New York Public Library (NYPL)) to provide on-line access to the Library's MARC data base through a connection with the computer facility at NYPL. The pilot operational phase will begin early in 1977, the Library of Congress module being implemented through the joint efforts of the MARC Development Office and the Information Systems Office, with advice from the Network Development Office. This project will be the first step in achieving on-line linkages between computerized library networks and the Library of Congress.

Other Major Developmental Activities

Automated Process Information File

The Automated Process Information File (APIF) System, developed by the MARC Development Office to provide in-process control of the cataloging of approximately 235,000 titles a year in the Processing Department, began limited operation in August 1976. This first phase of operation includes on-line input, on-line printing of cataloging forms and updating of the APIF record following shelflisting.

Computer Developments

Computer terminals linked to the MARC data base are now being used instead of card catalogs for thousands of bibliographic searches conducted by the Library of Congress staff. The computerized system allows rapid searching of the more than 730,000 records for books currently in the data base. This tool is called the MARC Search Service and was developed by the MARC Development Office. As part of the multiple USE MARC System, a still-developing generalized file maintenance and retrieval system, the MARC Search Service has had a significant impact on the work flow of almost a dozen different units in the Library of Congress. The system is available on any of 250 or more terminals which are in use in the Library's various departments and buildings. Originally records could be accessed by LC card number, by author/title key and by title key. Access by personal name and International Standard Book Number was added in the latter part of 1976. Keys are generated using main and added author entries and bibliographic and uniform titles. Users may request that, for records responding to search key, only those records containing a certain word or string of characters anywhere within a specified element or group of elements in the record be displayed. In many cases, this "qualification" technique reduces the number of responses to be reviewed by the searcher.

Late in 1976, a technique called Multiple Record Response became available on a test basis. This technique has been designed to enhance the process of on-line searching by providing an improved method of handling those responses to searches which result in a large number of records. It includes the use of abbreviated displays of the candidate records organized in a manner that allows a user, through an interactive process, to explore and choose those items that are likely candidates for satisfying the original search and for which a full display of the record is desired. The on-line MARC file is updated each night, reflecting an increase in the size of the file by about 550 records a day. When indexing of APIF records becomes operational in 1977, a request to the MARC Search Service will be searched on both the MARC and APIF files. Work is nearly complete on a system which supplies the bibliographic portion of records for titles on order that are new to the Library of Congress.

Register of Additional Locations

The *Register of Additional Locations* has been published since 1965 by the Library's Catalog Publication Division as a supplement to the *National Union Catalog* and contains additional locations for titles with imprints of 1956 to the present. The RAL has been a valuable tool in the area of interlibrary loans. Automated techniques have been used in the production of this publication beginning with the reports included in the 1968-72 quinquennial issue of the NUC and have been continued for the publication of subsequent annual issues of the RAL. Reports through 1975 comprise 11.75 million locations for 1.75 million titles. Reports through 1976 raise these figures to 13.79 million locations for 1.94 million titles, or an average of seven locations per title.

The MARC Development Office has recently completed the work to have the RAL file accessible on-line within the Library of Congress. This capability operates in conjunction with the MARC Search Service whereby the bibliographic contents and the LC card number can be retrieved from the MARC on-line files, and the added location reports, that is, the institutions other than the Library of Congress that own a particular title, can be obtained from the RAL file. The on-line file currently includes reports through 1975. The 1976 reports will be added shortly.

Search Services

An off-line search service of the MARC data base is now available through the Cataloging Distribution Service on a fee basis to any requestor. This offering of the search service is made on an experimental basis, as computer time is available. Off-line searches are accomplished by use of a retrieval program, the MARC Retriever, which is able to access any data found on a catalog card plus many additional data elements that have been specifically coded in the machine-readable record. Searching may be done on a one-time basis or on a monthly update basis (called a Current Awareness Search). Various options for sorting and printing the retrieved records are available.

NATIONAL REFERRAL CENTER

During 1976, the National Referral Center (NRC) engaged in a deliberate effort to make its data base more current. NRC verified and then updated more than half of the 11,500 records in the file. Each of these records described an organization capable and willing to supply information in one or more subject areas; virtually every subject area was represented--not just science and technology.

Extending the search capability to all six hierarchical agency name levels enhanced on-line access to this data base through the Library's Subject-Content-Oriented Retriever for Processing Information ON-Line (SCORPIO) system. This development made it possible, for example, to pinpoint the 45 records for the National Bureau of Standards (NBS) or the 189 National Oceanic and Atmospheric Administration (NOAA) records in lieu of having to search through all 327 records carried for the Department of Commerce as a whole. SCORPIO provides access to the data base for Congressional offices, the General Accounting Office and the Library itself. The general public may search the NRC data base through terminals located in various reading rooms. A modified version of the data base is also available from Oak Ridge, Tennessee, through the ERDA/RECON network.

The *NRC Switchboard* series issued two compilations--*Industrial Safety & Occupational Health*, actually a complete revision of a similar title first issued in 1972, and *Cold Regions*. Furnished free upon request, these publications

are annotated lists of organizations with information capabilities on selected topics.

PRESERVATION RESEARCH AND TESTING OFFICE

During the year, some of the preservation research has resulted in U.S. Patents 3,898,356; 3,939,091; and 3,969,549; entitled respectively *Method of Deacidifying Paper, Composition for Use in Deacidification of Paper,* and *Method of Deacidifying Paper.* The Office also has a patent pending for a method of deacidifying paper by immersion in solutions of metal alkyls.

While no joint agency programs are underway, the Preservation Research and Testing Office does maintain close liaison with related work at the National Bureau of Standards (NBS).

REGISTER OF ADDITIONAL LOCATIONS

Beginning in 1976, LC made the current print-form *Register of Additional Locations* (RAL) available through separate subscription independent of the *National Union Catalog.* Furthermore, the Library issued a cumulated microform edition of RAL comprising reports for 1968 through 1975 in late 1976. The next scheduled cumulation in microform will cover 1968 through 1977, although LC may publish a cumulation through 1976 if there is sufficient demand for one. In June 1976, LC placed the RAL data base on-line for use by the staff of the Library. For more detail concerning this project, see MARC Activities.

Through special arrangement, the New York Public Library and Washington State Library provided their location information in machine-readable form. A Council on Library Resources (CLR)-funded study to identify other such machine-readable data bases containing location information is now in progress (COMARC).

SCIENCE AND TECHNOLOGY DIVISION

A change in the on-line computer services provided to the public in the Science Reading Room (SRR) through the SCORPIO system occurred in April 1976 when the Library of Congress Computerized Catalog (LCCC), a 7,000,000-record corpus representing the bulk of available Machine-Readable Catalog (MARC) monographic records, replaced the Selected Science and Technology Data Base (SSNT). The old SSNT had consisted of some 90,000 references selected by LC class from the MARC file plus approximately 6,000 references representing the SRR Reference Collection. SRR items, when retrieved and displayed on the screen, were explicitly labeled as belonging to that collection, a convenience feature which readers and staff alike highly valued. Since the LCCC upgrading, this feature was temporarily lost but is scheduled for reinstatement in the near future. Additionally, in May, the Division obtained five new high-speed video terminals with attached printers, three of them for public use in the SRR.

For the time being, Capitol Hill has the only access to the system, although Division staff has demonstrated SCORPIO at two meetings. One meeting convened at the Sheraton Park Hotel for the American Consulting Engineers Council and the other at the Washington Hilton Hotel for the American Psychological Association. The addition of MEDLINE and Bibliographic Retrieval Services (BRS) to the already available SDC's ORBIT, Lockheed's DIALOG and ERDA/RECON complexes increased Division personnel access to outside data bases. Plans were also worked out with the Defense Documentation Center (DDC) for access--probably by April 1977--to the unclassified portions of the Automatic Distribution (AD) collection and the RDT&E project information data bases. Bibliographic access to the AD collection is particularly attractive to the Division, since the full text of virtually every document is already represented within the Division's collection of approximately 1.6 million technical reports. In addition, most of these reports are on microfiche and can be supplied for viewing by SRR visitors within minutes, once the accession number is known.

New titles issued in the *LC Science Tracer Bullet* series were *Administration & Management of Scientific & Technical Libraries, Women in the Sciences, Home Food Preparation, History of Psychology, Unconventional Sources of Protein, Endangered Species (Plants), Airships, Fire Retardants* and *Hypertension* (the last two in press). These dynamic guides to the literature on selected topics have proven highly popular. They are compiled by the Division's science reference librarians and are distributed free upon request. Three Division publications were in press as the year ended--*Unidentified Flying Objects--A Selected Bibliography* (by Kay Rogers), *Publications Prepared by the Science and Technology Division, 1940-1975* and the *Antarctic Bibliography,* v. 8. The latter, prepared with support from NSF's Division of Polar Programs, was photocomposed on the Library's VideoComp equipment. The VideoComp is capable of setting diacritical marks that the Government Printing Office Linotron photocomposer still cannot handle. The resultant publications were an improvement over earlier volumes which had been printed by computer line printer with diacriticals added later by hand. A related publication, *Current Antarctic Literature,* continued to appear monthly with cumulative indexes issued every four months. The National Aeronautics and Space Administration (NASA) sponsored the publication of two compilations by the Division's Aeronautics Projects. The first is *Astronautics and Aeronautics, 1973: Chronology of Science, Technology, and Policy,* which is the last and final of nine such volumes compiled by the Division since the mid-sixties, and the second is the long-awaited *NASA Historical Data Book 1958-1968. Volume I, NASA Resources* by Jane Van Nimmen and Leonard Bruno. As the Aeronautics Project was coming to an end, the Library's Federal Research Division transferred two other projects into the Science and Technology Division. One of these, supported by NASA, has the task of surveying the foreign literature, especially that of the Soviet Union, dealing with space medicine and exobiology. The other project, supported by the Environmental Protection Agency (EPA), has the task of surveying the foreign official literature dealing with the environment.

Through an exchange agreement with the Japanese Institute of Polar Research, LC sent a computer tape containing the Antarctic bibliographic data base to Japan. In return, the Institute is sending abstracts of Japanese Antarctic literature to the Cold Regions Bibliography Project currently in operation within the Library. Future plans call for sending updated tapes to Japan every three months. The Japanese Institute of Polar Research intends to use these for computer retrieval, both in the batch mode and on-line--the latter repre-

senting the first such use of that data base, now containing some 17,400 bibliographic citations and growing at a rate of about 1,600 items per year. The agreement, which is expected to benefit both exchange partners, is another example of the genuine spirit of international cooperation that characterizes the Antarctic research community.

SERIAL ACTIVITIES

CONSER Project

In the near future, the MARC serials distribution service will begin including partial records input by the Library of Congress. These partial records will consist of descriptive cataloging data and ISSN/Key title information, when available. LC staff will update the partial records to full-level records upon the assignment of subject headings and LC and Decimal Classification numbers and finally redistribute them to subscribers.

National Serials Data Program

The National Serials Data Program (NSDP), as the U.S. center of the International Serials Data System (ISDS), has registered U.S. serial publications by assigning an international standard serial number (ISSN) to titles cataloged by the Library of Congress, the National Agricultural Library and the National Library of Medicine. The appropriate ISDS centers have provided the proper ISSN needed for foreign imprints processed by these three national libraries. NSDP has extended its coverage to include registration of titles input into the CONSER data base by the participants of that project.

The NSF-funded project to build a large machine-readable data base for serials in science and technology made good progress during the year. Members of the National Federation of Abstracting and Indexing Services cooperated in the project by providing appropriate documentation on scientific and technical serials.

As part of its effort to encourage widespread use of ISSN by the information community, NSDP has distributed a series of brochures (*ISSN: A Brief Guide* and *ISSN: Procedures for Requesting Assignment*) explaining the uses and advantages of the system.

SUBJECT HEADINGS

During the year, a major change in subject heading practice took place. Indexing shifted from a mixture of direct and indirect methods of local subdivision to a purely indirect system, so that users will now find materials collected under category headings at higher jurisdictional levels (county and state).

In mid-1976, users could obtain *Library of Congress Subject Headings* in microform through annual subscription which included updated editions of the entire list every three months. For more information concerning Library of Congress activities, contact: James McClung, Information Office, Library of Congress, Washington, D.C. 20540, (292) 426-5108.

NATIONAL COMMISSION ON LIBRARIES AND INFORMATION SCIENCE

Established as a permanent and independent agency on July 20, 1970 (PL 91-345), the National Commission on Libraries and Information Science (NCLIS) has the responsibility for developing and recommending to the Congress and the President overall national plans to assure optimum provision of library and information services adequate for the information requirements of the people of the United States. NCLIS is authorized to advise Federal, State and local government agencies and private organizations in matters concerning library and information services, and to contract with Federal, public and private agencies to carry out its functions.

The recommended national program is structured in such a way so as to permit the correction of current deficiencies and the recognition of future requirements. The program will coordinate and reinforce all Federal and State efforts to support local and specialized information services. It contains the following eight specific objectives:

- to ensure that basic library and information services are adequate to meet the needs of all local communities
- to provide adequate special services to the appropriate constituencies, including those not presently served
- to strengthen existing statewide resources and systems
- to ensure basic and continuing education for personnel essential to the implementation of the national program
- to coordinate existing Federal programs of library and information service
- to encourage the private sector to become an active partner in the development of the national program
- to establish a locus of Federal responsibility charged with implementation of the national network and coordination of the national program under the policy guidance of NCLIS (the locus agency should have the authority to award grants and contracts and to promote standards, but should be supportive rather than authoritive, and should coordinate rather than regulate)
- to plan, develop and implement a nationwide network of library and information services.

WHITE HOUSE CONFERENCE TO NCLIS

The Commission received a major boost in its efforts to implement these objectives when the President announced in July that he was calling the long-awaited White House Conference on Library and Information Services and followed up on this announcement by including in the first Supplemental Appropriations Bill for fiscal year 1977, the request for the 3.5 million authorized for the Conference. Even before the White House Conference (now scheduled for late 1979) is held, the 57 State and Territorail conferences, which will precede it, will have provided the Commission with invaluable detailed information on the resources, needs and priorities of the individual states and territories which could have been obtained in no other way.

SUPPORTING STUDIES

In order to intelligently plan and implement a National Program, the Commission needed data on libraries' current position with regards to a national policy and the direction they should be taking. Several studies, each designed to illuminate a special aspect of U.S. information needs and sources, gathered this data. The studies are, as follows:

- National Inventory of Library Needs. With the aid of data from the Library General Information Survey (LIBGIS) and the National Center for Educational Statistics (NCES), NCLIS has collated information on U.S. information and library resources. The results of this study will provide a sound basis for assessing the magnitude of library user needs and for planning effective remedial programs.

- Role of the Library of Congress in the National Network. NCLIS and the Library of Congress have negotiated a five-part study which will review the current status of library networks and study the efforts of the National Libraries (Congress, Agriculture, Medicine) in network development and bibliographic control.

- Federal Funding for Public Libraries. Recently, it was proposed that categorical aid programs for public libraries be phased out in favor of revenue sharing plans. Information from Commission hearings and libraries indicated that revenue sharing was not effective for libraries. This study provided factual, reliable evidence to support a continuation of categorical funds.

- Analysis of Library Photocopying. Crucial to the development of a National Program is resolution of the differences between libraries and publishers on the question of the photocopying of copyrighted materials. With financial assistance from the Division of Science Information of the National Science Foundation (DSI/NSF) and the Commission on New Technological Uses of Copyrighted Work (CONTU), NCLIS has sponsored a national study to determine the volume and characteristics of library photocopying; the results should be published in the summer of 1977.

IMPLEMENTATION ACTIVITIES

Throughout the year, NCLIS involved itself in encouraging the implementation of the National Policy by organizing several activities in 1976; these activities highlight the diverse nature of the NCLIS purpose and functions.

National Policy Issues Conference

The Commission planned a two-day conference to foster the Domestic Council on the Right of Privacy in its quest for adequate input in the preparation of recommendations to the Federal Government. This brief, intensive session collected the diverse points of view from the information community concerning the emerging issues of information policy.

National Bibliographic Control

The Committee for Coordination of Bibliographic Control is moving on several fronts toward the development of a national standard for the unique identification of all information-bearing materials. Efforts in this activity have included studies of a name authority file, bibliographic format, use of International Standard Book Numbers for control and the use of bar codes on bibliographic materials.

Task Force on a National Periodicals System

Establishing national bibliographic control would be pointless unless, at the same time, users were able to obtain physical access to copies of the resources controlled. In response to this problem, NCLIS established the Task Force to discuss and plan a national periodical delivery system. Thus far, it has set its objectives and the service requirements for such a system. The final report will appear in published form in January 1977.

Management Institute

NCLIS has awarded a contract to the Graduate School of Library and Information Sciences at the University of Pittsburgh to conduct a Management Institute for State Library Agencies. The first part of the Institute was an intensive management training session held in 1976 for State library agency heads; plans for the second part, scheduled for Spring 1977, entailed a training session in the basic concepts of administrative planning, implementing and evaluating for new librarians and key staff members.

Computer Network Standard Protocol

Along with standardized bibliographic identity, the commission realized that standardized computer protocol was essential for the transfer of bibliographic records from one computer system to another. during the year, NCLIS supported a task force from the Institute for Computer Sciences and Technology (ICST) of the National Bureau of Standards (NBS) to study this problem and submit recommendations in the form of a proposal for a national standard.

OTHER ACTIVITIES

In addition to supporting and implementing acitivities, NCLIS has taken part in many other programs which help it in gathering data for the National Program. Work accomplished this year concerned the copyright issues, library services to Native Americans and communications with Federal agencies and community libraries. NCLIS is always looking ahead. The results of current and future studies will offer the basis upon which NCLIS can develop proposals for modifying existing legislation and/or proposing new legislation which will provide more effective support for library and information services within the United States.

Another significant event of 1976 was the enactment of Public Law 94-553, General Revision of the Copyright Law. NCLIS was an active participant in the discussions and negotiations which led to the addition of an exemption for Interlibrary Loan in Section 108 and suggested the addition of the provision which mandates a review of the impact of the section every five years. NCLIS also participated with the Commission of New Technological Uses of Copyrighted Works in the development of the library photocopying guidelines included in the Conference Report (No. 94-1733) on the bill.

For further information on NCLIS science information activities, contact: A. Trezza, Executive Director, National Commission on Libraries and Information Science, 1717 K Street, N.W., Washington, D.C. 20036, (202) 653-6252.

SMITHSONIAN SCIENCE INFORMATION EXCHANGE, INC.

The Smithsonian Science Information Exchange (SSIE) serves as the major national source for information on current and recently terminated research in all fields of science. The users include Federal agencies, educational and other research communities as well as the general public. The Exchange annually collects, indexes, stores and disseminates information on approximately 125,000 Government and non-Government research projects in all areas of life, physical and social sciences.

SSIE gathers project information from over 1,300 supporting Federal Government agencies, State and local governments, nonprofit organizations and colleges and universities. A staff of scientists and engineers indexes this information for subsequent storage and retrieval. Additionally, SSIE furnishes information in response to a wide range of requests. Researchers call upon SSIE resources in order to provide background information to satisfy the following requirements:

- avoid unwarranted duplication of research effort and expenditure
- obtain information to support grant or contract proposals
- locate possible sources of support for research in a specific subject area
- identify leads to the published literature
- stimulate new ideas for research planning and innovations in research techniques
- acquire source data for technological forecasting and development
- survey broad research areas to identify trends and patterns and to reveal gaps in overall research efforts
- learn about the current work of a specific researcher, organization or organizational unit.

SSIE has a broad user base among Federal agencies, industrial organizations, special libraries, individual scientists and research administrators. One-page Notices of Research Projects (NRP's) distributed in response to requests from these groups reached over a million in 1976.

Users may request services directly from SSIE, where a professional staff with training and research experience in the various scientific disciplines included in the Exchange's data base can discuss specific research information needs. SSIE scientists have designed subject search strategies in a context consistent with the retrieval of information relevant to individual requirements.

Other services available include the following:

- predesigned research information packages in subject areas of current interest
- nationwide and international on-line search service
- selective dissemination of ongoing research information on a monthly or a quarterly basis
- special compilations and tabulations of data
- machine processable data files.

Among the significant events occurring in 1976 was an internal reorganization of the Exchange which focused on the addition of two new senior officers. Donald A. Elliott, M.D., Ph. D., and Harald R. Leuba, Ph. D., joined the staff of the Exchange in August 1976. Dr. Leuba assumed responsibility for the Sciences Division of the Exchange while Dr. Elliott began directing the activities of the Medical Sciences Division, as well as the CCRESPAC program (see below). With the addition of these two senior scientists, plus the creation of a new Division of Program Planning, Management, and Administration, directed by Mr. David W. Lakamp expectations are high that a greater opportunity for interaction between SSIE and the research community and new and improved services will result.

During the year, the Exchange redesigned its long-range plan. The plan initiated provisions for developing new products and services which will insure an increasing response to user needs. The Denver Research Institute also conducted a study of SSIE users in late 1976 to provide additional information in considering new product and service activities, as well as to identify improvements which might be made to existing products.

NEW INFORMATION SERVICES, NETWORKS AND COMPUTER APPLICATIONS

Use of the SSIE On-Line Search Service grew steadily through the year. Over 500 organizations accessed the SSIE file on-line, directly acquiring ongoing research information in order to respond to the immediate need-to-know of research managers, scientists and information specialists. Because this service also provides access to many other data bases with the same search language, staff can now more easily add information about current research from the SSIE data file to bibliographic information. Because a higher proportion of SSIE on-line user organizations are commercial firms than is the case for other SSIE services, the Exchange has increased its service to this community of users. The direct access feature of service to commercial firms appears to meet the unique information requirements of the private sector, where timeliness and proprietary considerations often apply.

PROGRAMS IN SUPPORT OF FEDERAL AGENCIES

Toxicology

In support of the Toxicology Information Program (TIP) at the National Library of Medicine, SSIE Has comp-

leted Volume I of the *Toxicology Research Projects Directory*. Consisting of four quarterly issues and a year-end cumulative index, this timely series of publications, covering 8,400 ongoing research projects in toxicology and related areas, has continued into the second year. As part of the same program, the toxicology data base at SSIE provides administrative tabulations and tables of data for management analysis, and evaluation of trends and patterns of support of toxicological research.

Water Resources

SSIE continued to serve as the national cataloging center for current water resources information and prepared Volume II of the *Water Resources Research Catalog* for the Office of Water Research and Technology (OWRT) of the U.S. Department of the Interior.

A mailed questionnaire surveyed Federal and non-Federal organizations supporting water resources-related research to review SSIE's collection of project descriptions, to add new project descriptions to the file and to update descriptions of continuing projects.

SSIE prepared the Catalog, which contains 2,841 project descriptions organized into chapters corresponding to the water resources research categories established by the Committee on Water Resources Research of the Federal Council for Science and Technology. In addition, the Exchange furnished a computer tape file of the project descriptions to update the information available on current water research in the Office of Water Research and Technology on-line information and retrieval system.

Dental Research

The Exchange continued its program of assistance to the National Institute of Dental Research (NIDR), U.S. Department of Health, Education, and Welfare for research management and research information dissemination. SSIE prepared an extensive series of tables—78 in all—containing data on NIDR-supported research, as well as a catalog of all current dental research registered with the Exchange from both Federal and non-Federal organizations supporting this research.

The tables of data summarize NIDR extramural research grants, training grants and awards, and research contracts, as well as intramural research projects, relating program funding to substantive categories such as Caries, Periodontal Disease, etc. NIDR published the tables and associated indexes describing the salient features of the projects in *National Institute of Dental Research Programs: Fiscal Year 1975 Funds*.

The catalog of current projects, entitled *Dental Research in the United States, Canada, and Great Britain Fiscal Year 1975: A Catalog of Dental Research Projects Sponsored During FY 1975 by Federal and Non-Federal Organizations*, contains 1,435 biomedical research projects organized into subject categories by NIDR program leaders and Directors of the five NIDR Dental Research Institutes and Centers. SSIE staff designed the subject classification system to assist NIDR in the analysis of the overall current dental research effort. SSIE also prepared a set of 25 tables and pie charts summarizing the project descriptions included in the catalog by subject, performing organizations, type and location, and other categories, for use within NIDR in future program planning and management.

Aerospace

For the third year, SSIE selected and prepared current research information for inclusion in NASA's *Scientific and Technical Aerospace Reports* (STAR). This twice-monthly publication uniquely contains in a single publication both information about ongoing research and bibliographic information of interest to the aerospace community.

INTERNATIONAL PROGRAMS

Ongoing Research Information Systems Directory

With the support of the National Science Foundation and in cooperation with UNESCO's UNISIST program, SSIE has undertaken the compilation of an international directory of ongoing research information systems. The Exchange initiated this effort on the basis of the widespread agreement on the need for such a directory which emerged from the International Symposium on Information Systems and Services held in Paris in 1975. Intended to serve both as a referral tool and as an initial step toward encouraging cooperation and development in the ongoing research information field, the directory will include entries describing all responding systems which are operational or in an advanced stage of development, as well as a state-of-the-art overview, based on a qualitative and quantitative analysis of the data received. Late-1977 is the projected publication date.

Energy Research

During 1976, SSIE completed its initial effort in a program to collect information on energy research in progress in Canada and five European countries (France, Great Britain, Italy, the Netherlands and the Federal Republic of Germany). The National Science Foundation published information on some 1,800 projects under the title: *Information on International Research and Development Activities in the Field of Energy* (GPO Stock No. 038-00-00282-1). Now in its second year, SSIE has expanded the effort to include information on energy research in progress in Denmark, Israel and Sweden, in addition to the collection of updated information from the original six countries. This program has resulted in an active file containing descriptions of some 2,500 foreign energy research projects, in addition to the approximately 6,000 U.S. projects in the data base.

National and International Support for Cancer Research

In 1976, SSIE completed its second year as the Current Cancer Research Project Analysis Center (CCRESPAC), a component of the International Cancer Research Data Bank Program of the National Cancer Institute. Center activities focused on acquisition of cancer research project descriptions not already in the data base from both foreign and domestic cancer researchers. CCRESPAC indexed all projects with specific terms of cancer research interest to facilitate the retrieval of information and produced Special Listings of Current Cancer Research in over 50 research areas. Since the Center automatically distributed these listings to the cancer investigators working on the projects, this targeted distribution served as a means for alerting individual scientists of recently funded approaches to research problems.

relevant to their specific areas of research interest. The current cancer data base included approximately 14,000 research project descriptions. These were sent quarterly, complete with indexing, on magnetic tape to the National Library of Medicine, which provided on-line access through CANCERPROJ, a component of CANCERLINE.

CCRESPAC also provided assistance to the Cancer Information Dissemination Analysis Centers, which collect abstracts of the published literature for distribution to the cancer researchers in that area. CCRESPAC helped define the subject areas and identified the individuals most likely to benefit from abstracts of the literature in each subject area.

For further information on SSIE science information activities, contact: Dr. D. F. Hersey, President, Smithsonian Science Information Exchange, Inc., Room 300, 1730 M Street, N.W., Washington, D.C. 20036, (202) 381-4211.

GLOSSARY OF ACRONYMS

A & I	abstracting and indexing
ACCESS	the title of a NASA motion picture
AD	automatic distributi[illegible]
ADAMHA	Alcohol, Drug Abuse, [illegible]d Mental Health Administration
ADD	automatic document distribution
ADDS	AID Document Distribution System
ADEPS	Automated Engineering Document Preparation System
ADP	automated data processing
ADTS	Automated Data and Telecommunications Service
AEC	Atomic Energy Commission
AFB	Air Force Base
AFOS	Automation of Field Operations and Services
AFSC	Air Force Systems Command
AGARD	NATO Advisory Group for Aerospace Research and Development
AGECON	agricultural economics data base
AGRICOLA	AGRICultural On-Line Access
AGRIS	Agricultural Research Information System
AHA	American Hospital Association
AIAA	American Institute of Aeronautics and Astronautics
AID	Agency for International Development
ALERT	a GIDEP service which notifies participants of problem areas
ANTs	Abstracts of New Technology
APBI	Advanced Planning Briefings for Industry
APH	Automated Process Information File
APTIC	Air Pollution Technical Information Center
ARS	Agricultural Research Service
ASFA	Aquatic Sciences and Fisheries Abstracts
ASFIS	Aquatic Sciences and Fisheries Information System
ASIS	American Society for Information Science
ASRDI	Aerospace Safety Research and Data Institute
AST	Division of Astronomical Sciences, NSF
ASTM	American Society for Testing Materials
AVLINE	Audiovisuals On-Line
BASIS	Battelle Automated Search Information System
BCN	Biomedical Communications Network
BGN	Board on Geographic Names
BIOSIS	Biosciences Information Service of Biological Abstracts
BLM	Bureau of Land Management, boundary layer model
BRS	Bibliographic Research Service
BSSS	bathymetric swath survey system
BT	bathythermogram
CAIN	CAtaloging-INdexing
CALPHAD	calculations of phase diagrams
CANCERLINE	NLM/National Cancer Institute on-line data base
CANCERPROJ	ongoing cancer research projects and clinical trials on-line data base at NLM
CAT	computerized axial tomographic
CATLINE	CATaloging on-LINE
CBT	Center for Building Technology
CCEA	Center for Climatic and Environmental Assessment
CCRESPAC	Current Cancer Research Project Analysis Center
CDBG	Community Development Block Grant
CFR	Center for Fire Research
CIP	cataloging in publication
CLR	Council on Library Resources
CMCS	construction management control system
COBOL	Common Business Oriented Language
CODATA	Committee on Data for Science and Technology
COM	computer output microform/microfilm/microfiche
COMARC	cooperative MARC Pilot Project
CONSER	Conversion of Serials
CONTU	Commission on New Technological Uses of Copyrighted Works
COSATI	Committee on Scientific and Technical Information
COSPAR	Committee on Space Research
COST	Continental Offshore Stratigraphic Tests
CPD	Community Planning and Development
CPDB	Country Program Data Bank
CPI	Clearinghouse Program File
CPIs	Critical Performance Indicators
CRIS	Current Research Information System
CRS	Congressional Research Service
CRT	cathode ray tubes
CTS	Communications Technology Satellite
DCASR	Defense Contract Administration Region Services
DDC	Defense Documentation Center
DHEW	Department of Health, Education, and Welfare
DIALOG	nationwide retrieval network operated by Lockheed Information Systems
DIS	Document Index System
DLA	Defense Logistics Agency
DOD	Department of Defense
DOI	Department of the Interior
DOT	Department of Transportation
DPCCP	Defective Parts and Components Control Program

DRACON	Drug Abuse Communications Network
DROLS	Defense RDT&E On-Line System
DSI	Division of Science Information
DSDP	Deep Sea Drilling Project
EDS	Environmental Data Service
EEDB	Energy Information Data Base
EMI	Exchange of Medical Information
EPA	Environmental Protection Agency
EPILEPSYLINE	on-line data base at NLM of citations and abstracts relating to epilepsy
ERDA	Energy Research and Development Administration
ERIC	Educational Resources Information Center
ERL	Environmental Research Laboratories
EROS	Earth Resources Observation System
ESA	European Space Agency
ESDB	Economic and Social Data Bank
ESIC	Environmental Science Information Center
ESP	extended streamflow prediction
FAO	Food and Agriculture Organization
FAS	Fuels Availability System
FDA	Food and Drug Administration
FEA	Federal Energy Administration
FEDLINK	Federal Library and Information Network
FEILS	Federal Energy Information Locator System
FGGE	First GARP Global Experiment
FID	International Federation for Documentation
FIPS PUBS	Federal Information Processing Standards Publications
FIREBASE	a computer-assisted, bibliographic reference service of the USDA Forest Service
FNIC	Food and Nutrition Information and Educational Materials Center
FPA	Federal Preparedness Agency
FSEC	Federal Software Exchange Center
FSS	Federal Supply Service
FY	fiscal year
GARP	Global Atmospheric Research Program
GATE	GARP Atlantic Tropical Experiment
GATT	General Agreement on Tariffs and Trade
GIDEP	Government/Industry Data Exchange Program
GOES	Geostationary Operational Environmental Satellite
GOES DAP	Geostationary data system of National Environmental Satellite Service
GPO	Government Printing Office
GSA	General Services Administration
GSFC	Goddard Space Flight Center
HABITAT	United Nations conference on human settlements
HQ	headquarters
HRA	Health Resources Administration
HUD	Housing and Urban Development
IAA	International Aerospace Abstracts
IAC	Information Analysis Center
IAEA	International Atomic Energy Agency
IATTC	Inter-American Tropical Tuna Commission
ICC	Information Center Complex
ICST	Institute for Computer Sciences and Technology
ICSU	International Council of Scientific Unions
ICSU/AB	Abstracting Board of the International Council of Scientific Unions
IDEIS	identification and development of energy information sources
IDOE	International Decade of Ocean Exploration
IDP	Information Dissemination Program
IEC	International Electrotechnical Commission
IEYGL	International Field Year for the Great Lakes
IIASA	International Institute for Applied Systems Analysis
IMS	International Magnetospheric Study
INIS	International Nuclear Information System
INSTARR	Institute for Arctic and Alpine Research
INT	Division of International Programs, NSF
IOC	Intergovernmental Oceanographic Commission
IR	information report
IR&D	independent research and development
IRS	International Referral Service
ISDS	International Serials Data System
ISO	International Organization for Standardizations
ISRAD	Integrated Software Research and Development
ISSN	International Standard Serial Number
ITRDB	International Tree-Ring Data Bank
ITU	International Telecommunication Union
IUGG	International Union of Geodesy and Geophysics
JPL	Jet Propulsion Laboratory
JSC	Lyndon B. Johnson Space Center
KWIC	Key-Word-in-Context
LAAM	levo-alpha-acetylmethodol – methadone alternative used in treatment of heroin addiction

LANDSAT	Land Use Planning Satellite
LC	Library of Congress
LCC	life cycle costing
LCCC	Library of Congress Computerized Catalog
LCPBM	life cycle planning and budgeting model
LEAA	Law Enforcement Assistence Administration
LIBGIS	Library General Information Survey
LTRDB	Laboratory of Tree-Ring Research Data Base
MARC	machine-readable cataloging
Mardis	Modernized Army Research and Development Information System
MAS	Minerals Availability System
MCIC	Metals and Ceramics Information Analysis Center
MCL	Mathematics and Computation Laboratory
MDR	manually digitized radar
MEDLARS	Medical Literature Analysis and Retrival System
MEDLINE	MEDical Literature On-LINE
MESA	Mining Enforcement and Safety Administration
MIL-STD	Military Standard
MIS	Metrology Information Service
MSS	multi-spectural scanner system
MSTIC	Model Interstate Scientific and Technical Clearinghouse
NAL	National Agricultural Library
NALNET	NASA Library Network
NARDIC	Navy Research and Development Information Centers
NARS	National Archives and Records Service
NAS	National Academy of Sciences
NASA	National Aeronautics and Space Administration
NATO	North Atlantic Treaty Organization
NAVMATINST	Navy Material Instruction
NAWDEX	National Water Data Exchange
NBS	National Bureau of Standards
NCALI	National Clearinghouse for Alcohol Information
NCC	National Climatic Center
NCDAI	National Clearinghouse for Drug Abuse Information
NCES	National Center for Educational Statistics
NCIC	National Cartographic Information Center
NCLIS	National Commission on Libraries and Information Science
NCMHI	National Clearinghouse for Mental Health Information
NEEDS	National Energy-and-Environment Data System
NEIC	National Energy Information Center
NESS	National Environmental Satellite Service
NGSDC	National Geophysical and Solar-Terrestrial Data Center
NHPIC	National Health Planning Information Center
NHTSA	National Highway Traffic Safety Administration
NIAAA	National Institute on Alcohol Abuse and Alcoholism
NICRAD	Navy/Industry Cooperative Research and Development
NIDA	National Institute on Drug Abuse
NIDR	National Institute of Dental Research
NIE	National Institute of Education
NIH	National Institutes of Health
NIMH	National Institute of Mental Health
NIOSH	National Institute of Occupational Safety and Health
NIS	Noise Information System
NLC	National Library of Canada
NLM	National Library of Medicine
NMAC	National Medical Audiovisual Center
NMC	National Meteorological Center
NNRLIS	National Natural Resources Library and Information System
NNR	Machine-Readable Archives Division
NOAA	National Oceanic and Atmospheric Administration
NODC	National Oceanographic Data Center
NOS	National Ocean Survey
NRC	National Referral Center, Nuclear Regulatory Commission
NRP	National Research Program, Agricultural Research Service
NRP's	Notices of Research Projects, SSIE
NSA	Nuclear Science Abstracts
NSDP	National Serials Data Program
NSF	National Science Foundation
NSRDS	National Standard Reference Data System
NSSDC	National Space Science Data Center
NTIAC	Nondestructive Testing Information Analysis Center
NTIS	National Technical Information Service
NUC	National Union Catalog
NWS	National Weather Service
NYPL	New York Public Library
OASIS	Oceanic and Atmospheric Scientific Information System
OCLC	Ohio College Library Center
OCS	Outer Continental Shelf
OECD	Organization for Economic Cooperation and Development
OMB	Office of Management and Budget
ONAC	Office of Noise Abatement and Control
OPA	Office of Public Affairs

OPP	Office of Pesticide Programs
ORBIT	On-Line Retrieval of Bibliographic Information Time-Shared
ORD	Office of Research and Development
OSRD	Office of Standard Reference Data
OSTP	Office of Science and Technology Policy
OT	Office of Telecommunications
OTAF	Office of Technology Assessment and Forecast
OTI	Office of Technical Information
OWRT	Office of Water Research and Technology
PACFORNET	Pacific Coast Forestry Information Network
PAIS	Project Accounting Information System
PAR	Planning Activity Report
PBS	Public Buildings Service
PDDC	Philadelphia/Pueblo Documents Distribution Center
PESTAB	Pesticides Abstracts
PIC	Pesticide Information Center
PLASTEC	Plastics Technical Evaluation Center
PMD	Program Management Directives
PPIS	Pesticide Product Information System
PPT	project performance tracking
PTLRS	Publications and Technical Literature Research Section
RAL	Register of Additional Locations
RALI	Resources and Land Investigation
RANN	Research Applied to National Needs
RD&D	research, development and demonstration
RDT&E	research, development, test and evaluation
RECON	remote console
RIE	Resources in Education
ROC	required operational capabilities
RRTIS	Renewable Resources Technical Information System
RUSTIC	Regional and Urban Studies Information Center
SAAD	Standards Application and Analysis Division
SAFEM	Safety and Fire Evaluation Model
SAL	Shared Acquisitions List
SBA	Small Business Administration
SCATT	science communication and technology transfer
SCORPIO	Subject-Content-Oriented Retriever for Processing Information On-Line
SDC	Systems Development Corporation
SDI	Selective dissemination of information
SEAMINFO	a special library service related to reclamation of mined land
SEEDIS	Socioeconomic, Environmental and Demographic Information System
SEL	Space Environment Laboratory
SELDADS	Space Environment Laboratory Data Acquisition and Display System
SEP	Software Exchange Program
SIGINT/EW	Signals Intelligence/Electronic Warfare
SIS	Shuttle Information System Standards Information System
SMS	Synchronous Meteorological Satellite
SOIS	Sales Order and Information System
SOLMET	NOAA data base format which arranges meterological parameters for use by solar energy professionals
SPACEWARN	NASA space data system
SPLASH	Special Program to List Amplitudes of Surges from Hurricanes
SPP	Speech Privacy Potential
SRIM	Selected Research in Microfiche
SRR	Science Reading Room
SRS	Social and Rehabilitation Service
SSA	Social Security Administration
SSIE	Smithsonian Science Information Exchange
SSNT	Selected Science and Technology
STAR	Scientific and Technical Aerospace Reports
STI	scientific and technical information
STIMS	Scientific and Technical Information Modular System
STINFO	scientific and technical information
STIO	Scientific and Technical Information Office
SUNY	State University of New York
SVIC	Shock and Vibration Information Center
SWIRS	Solid Waste Information Retrieval System
SWIRS	Solid Waste Information Retrieval System
TAB	Technical Abstract Bulletin, Technical Assistance Burea
TI	technical information
TIAC	Technical Information Analysis Center
TIC	Technical Information Center
TID	Technical Information Document
TIDD	Technical Information and Documentation Division
TIMSCOE	Temporary International Magnetospheric Study Central Information Exchange
TIP	Toxicology Information Program
TIROS	Television in Infrared Observation Satellite
TN	technology needs
TOD	Technical Objective Document
TOX-TIPS	Toxicology Testing in Progress
TOXLINE	Toxicology On-Line bibliographic retrieval service
TPS	Text Processing Systems

TRAIS	–	Transportation Research Activities Information System
TRIS ON-LINE	–	TRISNET On-Line
TRISNET	–	Transportation Research Information Services Network
TSD	–	Technical Services Division
UNEP	–	United Nations Environment Program
UNESCO	–	United Nations Educational, Scientific, and Cultural Organization
UNIDO	–	United Nations Industrial Development Organization
UNIFORMAT	–	Uniform Format - A PBS document listing standard codes of accounts for buildings
UNISIST	–	nonrepresentational acronym for the joint ICSU–UNESCO study
USAF	–	United States Air Force
USDA	–	United States Department of Agriculture
VA	–	Veterans Administration
VAMIS	–	Victorian Agricultural Management Information System
VAS	–	VISSR Atmospheric Sounder
VISSR	–	visible and infrared spon-scan radiometer
VSMF	–	Visual Search Microfilm Film
WARC	–	World Administrative Radio Conferences
WATSTORE	–	National Water Data Storage and Retrieval System
WDC–A	–	World Data Center A
WGA	–	Weekly Government Abstracts
WHOI	–	Woods Hole Oceanographic and Atmospheric Institution
WJE	–	Weiss, Jenny, Elster and Associates
WRSIC	–	Water Resources Scientific Information Center
WRU	–	Work Reporting Units
WWSSN	–	World Wide Standardized Seismic Network

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Government Printing Office	Carl A. LaBarre (202) 275-3345	Assistant Public Printer (Superintendent of Documents), U.S. Government Printing Office, Washington, D.C. 20402
Library of Congress Information Office	James McClung (202) 426-5108	Information Office, Library of Congress, Washington, D.C. 20540

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